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No. 5.

WASHINGTON, D. C.

July 3, 1891.

STATISTICS OF MANUFACTURES.

LUMBER MILLS AND SAW MILLS AND TIMBER PRODUCTS.

DEPARTMENT OF THE INTERIOR,

CENSUS OFFICE,

WASHINGTON, D. C., June 6, 1891.

SIR :

I respectfully transmit herewith a report on the mill and forest industries of the states of Michigan, Wisconsin, and Minnesota, prepared by Mr. GEORGE A. PRIEST, special agent, under the direction of Mr. FRANK R. WILLIAMS, expert special agent in charge of the collection of statistics relating to all branches of manufactures.

The great industries which form the subject of this report are considered in all their branches, from the cutting of the tree in the forest to the output of the finished product at the mill, each of the diverse interests being treated in a comprehensive manner.

The original plan for the statistical treatment of these important industries contemplated distinct and complete reports on six groups of states, arranged with reference to geographical location and leading characteristics of products.

Considering the group of states included in this report, it is found that the aggregate increase of product of the manufacturing industry which forms its principal subject is 29.66 per cent in quantity and 75.92 per cent in value since 1880; that the increase in the number of hands employed is 138.49 per cent, and the increase in total amount of wages paid is 141.26 per cent.

The difference between the increase in quantity of product and the increase of its value is partly explained by the fact that the business of finishing and remanufacturing the mill product at the point of production has been developed to an unusual degree during the decade, thus increasing the gross value of product and furnishing employment to a greatly increased number of hands, receiving a corresponding increase in the aggregate amount of wages paid. This development from 1880 to 1890 is as follows for the respective states :

PERCENTAGE OF INCREASE IN THE DECADE.

PERCENTAGE OF INCREASE IN—	Michigan.	Wisconsin.	Minnesota.
Quantity of mill products.....	4.90	78.35	84.72
Value of mill products.....	21.61	112.28	87.43
Value of mill products and remanufactures.....	29.92	175.99	159.61
Number of hands employed.....	80.80	266.80	247.83
Aggregate wages paid.....	83.89	290.44	209.38

The quantity of growing timber owned by the establishments reporting and available for present consumption appears to be only sufficient to supply their requirements for about five years.

It is due to the manufacturers engaged in this industry to acknowledge their promptness in rendering returns and the careful attention bestowed upon their preparation, which probably involved a considerable amount of time and expense to each establishment. It is hoped that the result will prove such an addition to industrial statistics as to be of value and practical use to all interested.

Very respectfully,

ROBERT P. PORTER,
Superintendent of Census.

THE SECRETARY OF THE INTERIOR.

STATISTICS OF MANUFACTURES.

LUMBER MILLS AND SAW MILLS AND TIMBER PRODUCTS.

BY GEORGE A. PRIEST.

LUMBER MILLS AND SAW MILLS.

In a report containing comparative statistics of the Tenth and Eleventh Censuses respecting the lumber-mill and saw-mill industry in the states of Michigan, Wisconsin, and Minnesota the following quotations from Professor Sargent's report for the Tenth Census are deemed appropriate :

Michigan is the greatest lumber-producing state in the Union. The value of its lumber product, with that of Wisconsin and Minnesota, exceeds one-third of the total value of all the lumber manufactured in the United States. This enormous development of the lumber business in the lake region is due to the excellence of its forests, the natural advantages of the country for manufacturing lumber, and the easy communication between these forests and the treeless agricultural region west of the Mississippi river.

The extinction of the forests of the lake region may be expected to seriously affect the growth of population in the central portion of the continent. The country between the Mississippi river and the Rocky mountains, now largely supplied with lumber from Michigan, Wisconsin, and Minnesota, must, for building material, soon depend upon the more remote pine forests of the Gulf region or those of the Pacific coast. A great development in the now comparatively unimportant lumber-manufacturing interests in these regions may therefore be expected.

The great northwestern pineries are not yet exhausted, and with newly introduced methods, by which logs once supposed inaccessible are now profitably brought to the mills, they may be expected to increase the volume of their annual product for a few years longer in response to the growing demands of the great agricultural population fast covering the treeless midcontinental plateau. The area of pine forests, however, remaining in the great pine-producing states of Michigan, Wisconsin, and Minnesota is dangerously small in proportion to the country's consumption of white-pine lumber, and the entire exhaustion of these forests in a comparatively short time is certain.

It is because of the peculiar importance and conditions of the industry in the states referred to that they are made the subject of a special report.

The object of the census inquiry regarding lumber mills and saw mills was to procure from manufacturers such information as would enable this office to present in the reports of the Eleventh Census the actual condition of the industry as conducted in its various branches, showing such condition by totals for states, counties, and the principal cities.

The form of the inquiry adopted was in its general plan in keeping with the form used by this office in the collection of statistics of manufactures generally.

In order to secure for the diverse interests of the great industry embraced in the inquiry a full statistical presentation under the general heads of "Capital invested," "Annual expense charges," "Labor and wages," "Materials used," and "Manufactured products," an arrangement of questions was required under each head which would include the entire series of operations, from the cutting of the tree in the forest to the output at the mill of the various finished products. It was essential that the schedule of questions should be in a form which could be used with equal facility for a report of the most extensive operations or of the smallest establishment.

From the individual returns made upon the form adopted the information contained in the following tables has been compiled.

A small percentage of the returns was so incomplete as to be unavailable for tabulation, and this office is now in correspondence with the establishments making such returns, with a view to obtaining correct data to be included in the final report.

Each individual report tabulated is in effect a ledger balance sheet, showing totals of capital employed, expenses of manufacture, and value of product in classified accounts for each branch of one of the largest and most diversified industries of the country, and each report, to be available for tabulation, had to be consistent in all its details. It

should be understood, however, that the statistics published furnish no more reliable data for ascertaining manufacturers' profits than a partially constructed ledger balance sheet bears to that exact statement of resources and liabilities which forms the only true basis for obtaining such a result. The inquiry conducted by this office included only such data as were necessary to form a comprehensive statistical statement for the industry under the heads mentioned.

In explanation of the scope of the inquiry under the title of "Lumber mills and saw mills," it should be stated that the term lumber mills means only those mills which manufacture sawed lumber as the principal product, while the term saw mills means all other mills in which logs or bolts form the principal raw material and are manufactured into any kind of product other than lumber. Of the latter class this report includes 171 mills manufacturing shingles exclusively, 86 mills manufacturing staves and headings exclusively, and 168 mills manufacturing miscellaneous products, as follows: Handles, chair stock and turned goods, wooden ware, hoops, ax helves, paving blocks, hubs, spokes, implement stock, veneers, cheese boxes, baskets, etc. The number of each class located in the respective states will be found in Note 2 to Table 12, page 15.

All other special industries using logs and bolts for raw material, such as pulp mills, etc., will be treated in connection with the principal industry to which they are most closely allied.

This report includes only those planing mills which are operated by lumber manufacturers in connection with lumber mills. All other planing mills, sash, door, and blind factories, box factories, turning works, and similar woodworking industries engaged in the remanufacture of lumber and saw mill products, will form the subject of future reports.

The results obtained respecting the principal subjects herein considered are summarized in the following exhibit, showing the magnitude of the industry in the states of Michigan, Wisconsin, and Minnesota during the census year 1890:

Value of forest products not manufactured at mill.....	\$30,426,194
Value of mill products.....	115,699,004
Value of remanufactures.....	21,112,618
Aggregate value of products.....	167,237,816

The production of this value required \$270,152,012 invested capital; the employment in the forest of 95,258 men, 99 women, 10 children, and 32,491 animals; the labor in the mills of 87,939 men, 646 women, and 653 children; the operation of machinery and mechanical appliances valued at \$23,559,334; the expenditure of steam and water power sufficient to lift 3,500,000 tons one foot in one minute; the removal of 1,262,151,180 cubic feet of merchantable timber from natural growth; the investment of \$7,890,254 in vessels, railways, and water ways specially used and owned by this industry for the transportation of its material and product, and the expenditure of \$99,688,256 for wages, subsistence, supplies, and miscellaneous expenses.

A striking illustration of the tendency to concentration in this industry, by carrying the manufacture of the crude material to the highest possible point at the place of its original production, is shown by the value of its remanufactures, which consumed 16.56 per cent of the quantity of sawed lumber produced.

The percentage of increase in the value of mill production and remanufactures compared with the value reported in 1880 is as follows: Michigan, 29.92 per cent; Wisconsin, 175.99 per cent; Minnesota, 159.61 per cent.

In some localities in Michigan the supply of all kinds of timber has become practically exhausted and a decreased production will be observed, while in other localities, from which the pine has been denuded, other varieties of timber are now utilized into a greater variety of products. This fact may also be cited in explanation of the increase shown in remanufactures.

The various statements in this report will show more particularly the sections and towns in which the industry has received its greatest development during the decade.

It appears from the census reports of 1880 that six of the nine cities in the United States showing the highest production of sawed lumber at that date were located in the group of states under consideration. In Table 1 and the text immediately following the names of these cities and the value of their product is given, together with their relative rank in this group in 1880 and 1890, respectively.

Special agents appointed to collect statistics of manufactures in cities and towns in which such statistics were not collected by enumerators were instructed by this office to report only the operations of mills located within the corporate limits of the places for which they were appointed, excepting reports to be made on Special Schedule No. 5a, Timber products. In the case of manufacturers of timber products whose operations are principally conducted in the forest, the establishments were reported according to the location of the operators' residence or principal office.

The following and all similar tables embrace only those establishments whose works are located within the corporate limits of the respective cities or towns:

TABLE 1.—RELATIVE RANK AND VALUE OF PRODUCTION OF SIX PRINCIPAL LUMBER-PRODUCING CITIES IN MICHIGAN, WISCONSIN, AND MINNESOTA.

CITIES.	1880.		CITIES.	1890.	
	Rank in value of production.	Value of mill products and remanufactures.		Rank in value of production.	Value of mill products and remanufactures.
Total		\$14,840,336	Total		\$25,837,239
Bay City, Mich.....	1	3,702,298	Minneapolis, Minn.....	1	6,581,456
Muskegon, Mich.....	2	3,199,250	Menominee, Mich.....	2	4,208,689
Minneapolis, Minn.....	3	2,740,848	Muskegon, Mich.....	3	4,016,094
Saginaw, Mich.....	4	2,035,606	Bay City, Mich.....	4	4,006,214
Manistee, Mich.....	5	1,867,500	Oshkosh, Wis.....	5	3,819,150
Menominee, Mich.....	6	1,294,834	La Crosse, Wis.....	6	3,202,636

In the preceding statement for Muskegon, Michigan, the value reported for 1880 does not include the village of Lakeside, which has since been embraced within the corporate limits of Muskegon, and is included in the report for 1890. The product of mills located in Lakeside, as reported in 1880, was \$2,452,127, which, added to that reported for Muskegon in the same year, aggregates \$5,651,377 as the true amount for comparison with 1890.

In 1890 the value of mill products and remanufactures reported from Saginaw, Michigan, was \$3,128,599; Winona, Minnesota, \$2,876,201; Alpena, Michigan, \$2,717,282; Marinette, Wisconsin, \$2,420,891, and Manistee, Michigan, \$2,030,570, the last-named city dropping from fifth place in 1880 to eleventh place in 1890 in relative rank among the cities of the Union.

The production of white-pine lumber was carried to its highest point in 1880 at the mouth of the Saginaw river, and that locality still holds its rank in this respect.

The aggregate value of production reported for Bay City, West Bay City, Saginaw, Essexville, and Zilwaukee, constituting the principal productive points on the Saginaw river, was \$8,520,943 in 1880 and \$9,927,405 in 1890. The aggregate quantity of material consumed during the census year 1890 was about six hundred and fifty million feet, sealed measure, and the quantity of standing timber now owned by establishments in the places named is reported to be about two and one-half billion feet.

The city of Menominee, at the mouth of the Menominee river, in Michigan, shows the greatest increase of production during the decade. In 1880 it ranked six in the nine principal lumber-producing points in the United States, and is now found to be the second.

In his report upon the Menominee river (Reports of the Tenth Census, volume IX, page 554), Mr. H. C. Putnam says:

All the mills upon the river are located at its mouth, in the towns of Marinette and Menominee, * * * and it is considered next to impossible to build more mills at that point. The river is here narrow, and the facilities for holding logs, shipping lumber, dockage, etc., are quite limited in proportion to the amount of timber left in the region tributary to this stream, and this body of pine may therefore be considered to a certain extent in reserve and likely to outlast many larger ones. There is little danger from fire on this river. The pine which is left grows upon the hard-wood ridges, interspersed with broad areas of swamp.

The aggregate value of production reported for Menominee (Michigan) and Marinette (Wisconsin) was \$2,536,168 in 1880 and \$6,629,580 in 1890. The aggregate quantity of material consumed at these points during the census year 1890 was about four hundred and fifty million feet, sealed measure, and the quantity of standing timber now owned by establishments in the places named is reported to be more than four billion feet, indicating a sufficient supply, at the present rate of consumption, for another decade.

For the purpose of comparison with the census reports of 1870, 1880, and 1890, the totals for each state are placed in contrast in a number of tables following. In all comparisons with values reported in 1870 it should be borne in mind that the values of that year were expressed in a currency which was at a great discount in gold. The average premium on gold during the twelve months (June 1, 1869, to May 31, 1870) which constituted the census year was about one-fourth (25.3 per cent). A premium on gold of one-fourth is equal to a discount on currency of one-fifth. For purposes of comparison, therefore, the values of 1870 should be reduced in that ratio.

The following table gives a comparative statement for the census years 1870, 1880, and 1890, showing totals by states of the number of establishments, capital invested, average number of hands employed, wages paid, cost of materials used, and value of manufactured products:

TABLE 2.—COMPARATIVE STATEMENT FOR THE CENSUS YEARS 1870, 1880, AND 1890.

STATES.	Year.	Number of establishments.	Capital invested.	AVERAGE NUMBER OF HANDS EMPLOYED.			Wages paid during the year. (a)	Total value of all materials used. (a)	Total value of mill products and manufactures.
				Males above 16 years.	Females above 15 years.	Children and youths.			
Michigan.....	1870	1,571	\$36,990,450	19,252	63	743	\$6,400,283	\$14,347,661	\$31,946,296
	1880	1,649	39,260,428	22,732	143	1,360	6,967,905	32,251,372	32,449,928
	1890	1,957	111,302,797	43,060	262	495	12,813,335	39,565,601	68,141,189
Wisconsin.....	1870	720	11,448,545	11,795	362	304	3,755,089	7,422,856	15,130,719
	1880	704	19,824,059	7,748	250	467	2,257,218	12,471,473	17,932,347
	1890	863	\$4,586,623	30,618	301	131	8,813,188	30,735,875	49,547,410
Minnesota.....	1870	207	3,311,140	2,899	14	39	880,028	2,193,965	4,299,162
	1880	234	6,771,145	2,732	22	100	924,473	4,929,053	7,366,038
	1890	320	27,497,187	9,887	13	27	2,860,090	11,972,854	19,123,023

a To enable a fair comparison under the heads of "Labor and wages" and "Materials used," only such items of the returns of 1890 are shown as correspond to the reports for the years 1870 and 1880, which embraced only the expenditure at the mill under these heads.

CAPITAL INVESTED.—There does not appear to be such a change in the actual conditions of the industry in 1890 compared with 1880 as to cause an appreciable change in the ratio of capital employed to the value of goods manufactured. A great difference is, however, shown in this respect, as indicated by the following statement:

TABLE 3.—AVERAGE CAPITAL INVESTED, AVERAGE VALUE OF PRODUCT, AND RATIO OF CAPITAL TO PRODUCT.

STATES.	1880.			1890.		
	Average capital invested per establishment.	Average value of product per establishment.	Ratio of capital to product equals the ratio of—	Average capital invested per establishment. (a)	Average value of product per establishment.	Ratio of capital to product equals the ratio of—
Michigan.....	\$23,809	\$31,807	\$0.749 to \$1.00	\$37,960	\$38,689	\$1.498 to \$1.00
Wisconsin.....	28,159	25,500	1.104 to 1.00	100,230	61,649	1.626 to 1.00
Minnesota.....	28,937	31,479	0.919 to 1.00	86,657	64,987	1.333 to 1.00

a The average capital stated for 1890 includes only the amounts reported by establishments which were in operation during the census year.

The disproportion shown is probably due to the radical change in the form of inquiry used in the Eleventh Census respecting capital. This change has resulted in a full showing of the capital employed in all branches of the industry, which result, it is believed, was not obtained in previous censuses.

The form of question used in the census of 1880 was as follows: "Capital (real and personal) invested in the business." The scope of the inquiry under the head of "Labor and wages" was restricted to labor employed at the mill, while under the head of "Materials used" the cost at the mill of logs or bolts consumed was reported. This form of inquiry, when addressed to an establishment owning timbered land and engaged in cutting standing timber, was not sufficiently comprehensive. In some cases the entire capital employed was reported, while in others only the capital directly employed in mill operations was stated.

The form of inquiry used in the census of 1890 required a distinct statement of capital employed in the production of logs and all other forest products, in the manufacture of logs into lumber or other mill products, and also in the remanufacture of such mill products into any other form of product. The subdivisions of the inquiry propounded respecting capital employed were calculated to develop the full amount of such capital, both owned and borrowed, and the results of the inquiry will be found in Table 12.

The term "capital invested" simply means all those resources or assets of an establishment which are employed in and properly pertain to the conducting of its business.

The aggregate stated is the real amount of investment for which the industry has to earn a return, although the proportion of "productive capital," *i. e.*, the amount invested in tools, implements, animals, and plant directly used in the process of manufacturing, is shown to be a minor proportion of the whole capital employed.

The average apportionment of each \$100 of capital employed to the principal classes of investment by manufacturers of the respective states is as follows:

TABLE 4.—AVERAGE APPORTIONMENT TO PRINCIPAL CLASSES OF INVESTMENT.

CLASSES OF INVESTMENT.	Michigan.	Wisconsin.	Minnesota.
Timbered land tributary to mill	\$32.00	\$37.08	\$21.31
Logging	13.35	13.23	16.79
Mill plant	19.94	16.52	24.67
Live capital	34.71	33.17	37.23

The items of rent, interest, and commissions paid, properly shown in Table 12 under the head of "Annual expense charges," should be eliminated from the cost of manufacture, in order to ascertain, approximately, the net earnings of the industry for the capital invested.

LABOR EMPLOYED AND WAGES PAID.—In previous census reports respecting the lumber-mill and saw-mill industry the statistics of labor employed and wages paid have been confined to a statement of the average number of men, women, and children, respectively, employed at the mills and the total amount paid in wages to all during the year.

The classified occupation and wage system was adopted in the present census in the form of questions calling for information as to labor and wages, and reports were obtained of the average number of men, women, and children employed in each class during the year and the total wages paid to each class in the various branches of occupation. A statement was also obtained showing the various rates per week or month and the average number of men, women, and children, respectively, employed at each rate.

The wage statistics compiled from these reports are stated in Table 12, and leave no margin of uncertainty. They are actual, and show absolutely the number of each class of wage laborers and their average earnings, which may be relied upon as an accurate presentation from employers' returns. They also include the number of officers or firm members actually engaged in productive labor or in supervision of the business at such rates of wages as would be paid to employés for similar service; they show also clerical labor at the mill, each class and its wages for the year being separately shown in the table referred to.

The number of hands reported in Table 2 for the year 1890 will not correspond to the total number reported in Table 12, because it is necessary, in order to enable a fair comparison with preceding years, to show for 1890 only those hands who were engaged in mill labor, exclusive of officers or firm members and clerks or salesmen, which classes were not included in previous census reports.

The average annual term of employment for mill employés is found by the reports for 1890 to be 7.11 months in Michigan, 6.43 months in Wisconsin, and 5.92 months in Minnesota. No information respecting the term of employment has been published in previous census reports. The average annual earnings per hand, after reducing to a gold basis the wages paid in 1870, is as follows:

TABLE 5.—AVERAGE ANNUAL EARNINGS PER HAND.

STATES.	1870.	1880.	1890.
Michigan.....	\$255	\$288	\$202
Wisconsin.....	241	267	284
Minnesota.....	238	324	283

The average term of mill operation per annum was 5.75 months in Michigan, 5.5 months in Wisconsin, and 4.75 months in Minnesota. The excess of the average term of employment for mill employés over the average term of mill operation is caused by the fact that the establishments having the maximum term of mill operation employ the greater number of hands.

STATISTICS OF MANUFACTURES.

The following table gives for the group of states the average number of wage earners employed in mill operation and care of mill product, and the actual total wages paid during the census year. Hands employed on piecework are not included.

TABLE 6.—AVERAGE NUMBER OF HANDS AND ACTUAL WAGES PAID.

CLASSES.	AGGREGATE.		MALES ABOVE 16 YEARS.		FEMALES ABOVE 15 YEARS.		CHILDREN.	
	Average number.	Total wages.	Average number.	Total wages.	Average number.	Total wages.	Average number.	Total wages.
Total	81,834	\$23,615,383	80,843	\$23,469,973	488	\$80,720	503	\$64,690
Operatives and skilled labor.....	33,344	10,643,768	33,085	10,610,632	161	23,642	98	9,494
Unskilled labor	48,490	12,971,615	47,758	12,859,341	327	57,078	405	55,196

The following table shows for the group of states the monthly rates of wages paid (including board when furnished as part compensation), the average number of hands employed at each rate, exclusive of those employed on piecework, and the average term of employment for hands employed at the respective rates of wages:

TABLE 7.—MONTHLY RATES OF WAGES PAID, AVERAGE NUMBER EMPLOYED, AND AVERAGE TIME EMPLOYED AT EACH RATE.

CLASSES.	\$10 and over, but under \$12.	\$12 and over, but under \$15.	\$15 and over, but under \$18.	\$18 and over, but under \$20.	\$20 and over, but under \$25.	\$25 and over, but under \$30.	\$30 and over, but under \$35.	\$35 and over, but under \$40.	\$40 and over, but under \$50.	\$50 and over.
Total.....	34	70	70	921	3,540	7,223	13,765	25,442	17,594	13,175
Males above 16 years, average number employed.				580	3,424	6,863	13,765	25,442	17,594	13,175
Females above 15 years, average number employed.		34		29	65	360				
Children, average number employed.....	34	36	70	312	51					

AVERAGE TIME EMPLOYED.

Months.....	3.78	4.29	5.71	6.98	5.87	6.75	5.63	6.71	7.29	7.33
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MATERIALS USED.—In explanation of the amount shown for 1890 in Table 2 as the cost of materials used in mill production and remanufactures, a table showing the items which produce the result obtained for each state is herewith given:

TABLE 8.—ITEMIZED COST OF MATERIALS IN MILL PRODUCTION AND REMANUFACTURES.

ITEMS.	Michigan.	Wisconsin.	Minnesota.
Value of stumpage.....	\$13,100,043	\$7,526,550	\$1,576,918
Cost of logging supplies	556,493	414,218	62,521
Wages paid in woods	5,018,931	3,265,897	699,663
Contract labor in woods.....	1,954,637	1,233,936	560,874
Keep of animals.....	1,007,647	744,820	206,501
Wages expended in transportation of logs to mill.....	558,827	638,741	260,511
All other expenses of transportation.....	3,220,001	1,549,983	348,455
Total cost of forest products.....	25,416,579	15,374,145	3,715,443
Deduct value of forest products which have not become the material of the mill.	5,909,584	2,361,357	1,347,807
Cost at mill of logs and bolts manufactured by milling establishments and used as material for mill products.	19,506,995	13,012,788	2,367,636
Add cost of logs and bolts bought.....	15,337,957	7,949,933	4,785,401
Total cost of logs and bolts delivered at mill.....	34,844,952	20,962,721	7,153,037
Add cost of mill supplies	1,189,959	673,927	256,251
Total cost of materials for mill products.....	36,034,911	21,636,648	7,409,288
Add cost of materials for remanufactures	3,530,690	9,119,227	4,563,566
Cost of materials entering into mill products and remanufactures.....	39,565,601	30,755,875	11,972,854

It appears from an examination of the preceding table that the cost of logs and bolts constitutes 96.74 per cent of the expenditure for materials entering into mill products. In the following table the percentage of cost of materials in each \$100 of product for three successive census years is placed in contrast:

TABLE 9.—PERCENTAGE OF COST OF MATERIALS.

STATES.	1870.	1880.	1890.
Michigan.....	44.91	61.49	58.06
Wisconsin.....	49.06	69.47	62.07
Minnesota.....	51.03	61.49	62.61

The cost of raw material has steadily advanced during the period embraced by the preceding table. At the close of the census year 1880 the market value of the manufactured product was just recovering from the depression which it had sustained in common with all manufactures as a result of the panic of 1873, and this fact is suggested in explanation of the abnormal proportion of the cost of material to the value of product as reported at that time.

The classification of products used in 1870 showed only sawed lumber, shingles, and laths specifically.

The classification used in 1880 embraced the following items specifically: Sawed lumber, laths, shingles, staves, headings, and spool and bobbin stock.

MANUFACTURED PRODUCTS.—The classification adopted for the reports of the Eleventh Census was enlarged at the request of operators in certain industries desirous of ascertaining the quantities of special saw-mill products required by such industries for raw material, and embraces all the foregoing in distinct classes, excepting laths, which, being usually made from slabs and edgings and not included in the scaled measurement of logs sawed, are therefore reported as a by-product under the head of "All other products." The added classes, consisting of furniture stock, carriage and wagon stock, agricultural implement stock, and pickets, are reported in the following table as sawed lumber, but a specific report for each class will be found in Table 12:

TABLE 10.—COMPARATIVE STATEMENT SHOWING TOTALS OF MILL PRODUCTION FOR THE CENSUS YEARS 1870, 1880, AND 1890, BY STATES.

STATES.	Year.	Number of establishments.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Laths. (Number.)	Value of all other products.	Value of remanufactures.	Total value of mill products and remanufactures.
Michigan.....	1870	1,571	2,251,613,000	658,741,000	(a)	(a)	304,051,000	\$1,332,922	(b)	\$31,946,396
	1880	1,649	4,172,572,000	2,584,717,000	199,821,000	21,897,000	461,805,000	531,406	(b)	52,419,928
	1890	1,914	4,311,240,000	2,841,213,000	247,875,000	32,085,000	(a)	6,024,244	\$4,358,206	68,141,189
Wisconsin.....	1870	720	1,068,199,000	806,807,000	(a)	(a)	102,663,000	620,591	(b)	15,130,719
	1880	704	1,542,021,000	862,922,000	82,545,000	7,498,000	215,132,000	152,171	(b)	17,952,347
	1890	842	2,861,517,000	1,369,022,000	58,187,000	7,819,000	(a)	3,029,103	11,437,739	49,547,410
Minnesota.....	1870	207	242,350,000	127,813,000	(a)	(a)	49,768,000	88,861	(b)	4,299,162
	1880	234	563,974,000	194,566,000	7,825,000	547,000	88,088,000	21,100	(b)	7,366,038
	1890	315	1,028,665,000	469,472,000	6,300,000	450,000	(a)	1,017,890	5,316,673	19,123,023

a Quantity not reported; value included in "All other products."

b Not separately reported.

The item of custom sawing is included under the head of "All other products," and is reported more fully than in previous years. An analysis of the individual reports shows 349 establishments engaged exclusively in custom sawing, as follows:

TABLE 11.—RECEIPTS FROM CUSTOM SAWING.

STATES.	Establishments.	Receipts from custom sawing.
Total.....	349	\$2,086,317
Michigan.....	200	1,457,121
Wisconsin.....	94	430,847
Minnesota.....	55	198,349

To avoid duplication, the products represented by the receipts for custom sawing or similar work are not specifically accounted for by quantity or value in the reports of mill establishments wholly or partially engaged in such work, because such establishments can not state the cost of materials which are furnished by and manufactured for others. The quantity and value of the material and its products is, however, embraced by the inquiry made on Special Schedule No. 5a, addressed to all manufacturers of timber products not operating mills. The tabulation of reports received on this schedule will be found on pages 49 to 52, inclusive.

STATEMENT IN DETAIL FOR 1890.—The following table shows the totals for each branch of the industry under the heads of "Capital invested," "Annual expense charges," "Labor and wages," "Materials used," and "Manufactured products" in the states of Michigan, Wisconsin, and Minnesota during the census year 1890:

TABLE 12.—LUMBER MILLS AND SAW MILLS.

CAPITAL INVESTED.

CLASSIFICATION.	AGGREGATE. (3,140 establishments reported.)		MICHIGAN. (1,957 establishments reported.)		WISCONSIN. (863 establishments reported.)		MINNESOTA. (320 establishments reported.)	
	Establishments reporting respective items.	Total amount.	Establishments reporting respective items.	Total amount.	Establishments reporting respective items.	Total amount.	Establishments reporting respective items.	Total amount.
AGGREGATE CAPITAL INVESTED (a).....		\$223,386,607		\$111,302,797		\$81,586,623		\$27,497,187
TIMBERED LAND:								
Timbered land tributary to mills located in the states named..	883	72,543,377	516	35,619,323	299	31,363,610	68	5,860,444
LOGGING EQUIPMENT:								
In tools, implements, and live stock.....	1,626	5,289,204	1,038	2,603,466	479	2,020,901	109	664,837
In logging railways and equipment.....	133	2,567,677	91	1,237,800	38	1,160,677	4	169,200
Canals and flumes or chutes.....	96	87,825	7	7,967	72	55,820	17	24,038
In river improvements (exclusive of stock in chartered boom companies).	405	1,466,472	191	426,644	181	733,731	33	306,097
In vessels used for transportation of lumber or logs, steam tugs, etc.	143	2,342,664	95	1,658,163	42	610,601	6	71,500
Forest products on hand, but not delivered at mill May 31, 1890.	1,098	16,290,817	782	8,510,513	258	5,547,568	58	2,232,736
All other capital invested specifically in logging	737	2,621,312	481	413,613	214	1,062,542	42	1,145,157
Total.....		30,665,971		14,858,166		11,191,240		4,616,565
MILL PLANT:								
Saw-mill plant:								
Land	2,756	8,109,946	1,731	4,032,547	790	2,187,793	235	1,889,606
Buildings.....	3,041	9,511,091	1,906	5,215,168	839	3,186,853	296	1,109,070
Machinery	3,140	21,872,633	1,957	12,074,328	863	6,948,000	320	2,850,305
Total		39,493,670		21,322,043		12,322,646		5,848,981
Planing-mill plant:								
Land.....	331	701,527	99	150,613	181	203,429	51	347,485
Buildings.....	390	801,775	131	177,208	196	460,546	63	164,021
Machinery.....	486	1,686,701	173	449,076	232	833,814	81	353,811
Total		3,190,003		776,897		1,547,789		865,317
Dry-kiln plant.....	141	268,218	79	99,267	47	100,234	15	68,717
Total mill plant		42,951,891		22,198,207		13,970,669		6,783,015
LIVE ASSETS:								
Logs and bolts at mill May 31, 1890.....	1,795	13,400,352	1,114	5,673,980	515	5,922,907	166	1,803,465
Lumber or other products (not planed or finished) on hand May 31, 1890.	1,954	31,706,274	1,210	15,784,057	566	12,251,742	178	3,670,475
Dressed lumber and remanufactured products on hand	656	3,448,930	286	1,212,878	279	1,504,499	91	731,533
Cash on hand, bills receivable, accounts receivable, and all sundries not elsewhere reported.	2,042	28,869,812	1,271	15,956,186	563	8,381,956	208	4,031,670
Total.....		76,925,368		38,627,101		28,061,104		10,237,163

a See Note 1 to Table 12, page 15.

TABLE 12.—LUMBER MILLS AND SAW MILLS—Continued.

ANNUAL EXPENSE CHARGES.

CLASSIFICATION.	AGGREGATE. (3,140 establishments reported.)		MICHIGAN. (1,957 establishments reported.)		WISCONSIN. (863 establishments reported.)		MINNESOTA. (320 establishments reported.)	
	Establishments reporting respective items.	Total amount.	Establishments reporting respective items.	Total amount.	Establishments reporting respective items.	Total amount.	Establishments reporting respective items.	Total amount.
Total		9,450,739		4,659,490		3,412,415		1,378,834
Rent	526	142,659	262	81,162	204	25,803	60	35,694
Taxes	2,622	1,834,224	1,626	996,744	739	681,235	257	156,245
Insurance	1,508	1,440,287	914	674,029	486	529,976	108	236,282
Ordinary repairs of buildings and machinery.....	2,461	1,808,839	1,554	973,582	676	600,590	231	234,667
Commissions and other expenses of selling (a).....	835	910,268	623	400,915	161	366,225	51	143,128
Amount paid for interest on cash used in the business.....	1,524	2,043,498	957	964,311	441	767,114	126	312,073
All other items of annual expense not elsewhere reported....	1,306	1,270,964	857	568,747	336	441,472	113	260,745

LABOR AND WAGES—SUMMARY FOR ALL BRANCHES.

STATES.	MALES ABOVE 16 YEARS.		FEMALES ABOVE 15 YEARS.		CHILDREN.		Aggregate of hands employed.	Aggregate of wages paid.	SUBSISTENCE OF ANIMALS.		Amount paid to con- tractors for logging	Estimated number of hands em- ployed by logging con- tractors.
	Total number.	Total wages paid.	Total number.	Total wages paid.	Total number.	Total wages paid.			Number of animals.	Cost of subsistence.		
Total	142,613	\$38,069,975	646	\$126,653	653	\$82,969	143,912	\$38,279,597	22,029	\$1,958,968	\$3,749,447	18,606
Michigan	70,791	20,036,825	299	60,236	495	61,416	71,585	20,158,477	9,240	1,007,647	1,954,637	8,425
Wisconsin.....	55,537	13,801,562	331	63,735	131	17,784	55,999	13,883,081	9,936	744,820	1,233,936	7,133
Minnesota.....	16,285	4,231,588	16	2,682	27	3,769	16,328	4,238,039	2,853	206,501	560,874	3,048

LABOR AND WAGES—HANDS EMPLOYED.

LOGGING OPERATIONS CONDUCTED BY MILLING ESTABLISHMENTS.	MICHIGAN. (1,914 establishments reported.)			WISCONSIN. (812 establishments reported.)			MINNESOTA. (315 establishments reported.)		
	Establishments reporting respective items.	Average number of hands employed during year.	Wages paid.	Establishments reporting respective items.	Average number of hands employed during year.	Wages paid.	Establishments reporting respective items.	Average number of hands employed during year.	Wages paid.
Total		33,729	\$7,532,395		30,607	\$5,138,574		8,944	\$1,521,048
Employed in the woods	753	21,674	5,018,931	359	18,877	3,265,897	83	3,799	699,663
Employed in transportation of logs to mill.....	542	3,630	558,827	265	4,597	638,741	58	2,097	260,511
Amount paid by milling establishments to contractors for logging—number of hands estimated.	209	8,425	1,954,637	192	7,133	1,233,936	35	3,048	560,874

LABOR AND WAGES—ANIMALS EMPLOYED.

LOGGING OPERATIONS CONDUCTED BY MILLING ESTABLISHMENTS.		Number.	Cost of subsistence.		Number.	Cost of subsistence.		Number.	Cost of subsistence.	
Employed in the woods.....	790	9,240	\$1,007,647		396	9,936	\$744,820	89	2,853	\$206,501

a The value of product reported is the net value at the mill, exclusive of expenses of selling, therefore the cost of this item of expense should not be considered as a charge on the cost of manufacture.

STATISTICS OF MANUFACTURES.

TABLE 12.—LUMBER MILLS AND SAW MILLS—Continued.

LABOR AND WAGES—LUMBER MILLS AND SAW MILLS.

EMPLOYÉS.	MICHIGAN. (1,914 establishments reported.)			WISCONSIN. (842 establishments reported.)			MINNESOTA. (315 establishments reported.)		
	Establish- ments reporting respective items.	Average number of hands employed during year.	Wages paid.	Establish- ments reporting respective items.	Average number of hands employed during year.	Wages paid.	Establish- ments reporting respective items.	Average number of hands employed during year.	Wages paid.
Total		45,088	\$14,158,289		29,173	\$8,706,172		9,804	\$2,995,769
Officers or firm members (a):									
Males	1,213	1,735	1,241,449	507	885	732,804	163	293	241,254
Females	12	14	7,480	9	10	9,290			
Clerks or salesmen:									
Males above 16 years	411	669	489,884	216	463	325,467	75	205	170,781
Females above 15 years	16	23	10,067	10	13	4,983	3	3	1,470
Mill operatives, engineers and other skilled work- men, overseers, and foremen or superintendents (not general superintendents or managers):									
Males above 16 years	1,821	18,373	5,746,247	822	8,803	2,779,554	306	3,763	1,157,399
Females above 15 years	30	75	9,682	18	71	10,825	5	6	675
Children	22	77	6,894	4	11	1,100	3	10	1,500
Watchmen, laborers, teamsters, and other un- skilled workmen:									
Males above 16 years	1,031	22,000	6,117,586	490	17,748	4,487,576	135	5,209	1,335,333
Females above 15 years	15	138	26,055	39	176	28,986	5	5	437
Children	61	248	32,702	11	68	7,132	4	11	1,388
Piecework (not included in the foregoing state- ment):									
Males above 16 years	202	1,543	445,547	75	886	315,619	23	293	81,932
Females above 15 years	5	49	6,952	4	37	2,801	1	2	100
Children	24	144	17,744	2	2	35	1	4	500

LABOR AND WAGES—PLANING MILLS CONNECTED WITH SAW MILLS.

EMPLOYÉS.	MICHIGAN. (173 establishments reported.)			WISCONSIN. (232 establishments reported.)			MINNESOTA. (81 establishments reported.)		
Total		1,193	\$122,430		3,352	\$1,272,271		628	\$282,096
Officers or firm members (a):									
Males	7	11	\$,179	13	18	20,322	2	4	1,270
Females									
Clerks or salesmen:									
Males above 16 years	4	12	10,325	22	79	69,599			
Females above 15 years				4	7	2,790			
Mill operatives, engineers and other skilled work- men, overseers, and foremen or superintendents (not general superintendents or managers):									
Males above 16 years	127	635	230,327	183	1,171	531,577	62	340	165,528
Females above 15 years				8	9	2,460			
Children									
Watchmen, laborers, teamsters, and other un- skilled workmen:									
Males above 16 years	75	509	169,523	138	2,010	634,406	37	282	114,917
Females above 15 years				2	8	1,600			
Children	4	26	4,076	5	50	9,517	1	2	881

a Only those officers or firm members are reported who were engaged in supervision of the business or in productive labor. The wages stated are those which would be paid for similar service if performed by employes.

TABLE 12.—LUMBER MILLS AND SAW MILLS—Continued.

MATERIALS USED.

LOGGING, LUMBER MILLS AND SAW MILLS, AND PLANING MILLS AND REMANUFACTURES.	AGGREGATE. (3,071 establishments reported.)			MICHIGAN. (1,914 establishments reported.)		
	Establish- ments reporting respective items.	Quantity.	Value. (a)	Establish- ments reporting respective items.	Quantity.	Value. (a)
AGGREGATE VALUE OF MATERIALS USED.....			\$75,762,093			\$36,935,143
LOGGING: (b)						
Quantity and value of standing timber cut during year by milling es- tablishments.	1,264	5,864,104,293	22,203,511	787	3,200,762,122	13,100,043
Logging supplies used (exclusive of supplies included in report of wages and subsistence).	791		1,033,232	499		556,493
Transportation of logs to mill (exclusive of items reported under head of "Labor and wages").			5,118,439			3,220,001
Total.....			28,355,182			16,876,537
LUMBER MILLS AND SAW MILLS: (c)						
Quantity and cost of logs or bolts purchased.....	2,042	3,981,009,361	28,073,291	1,331	2,258,500,816	15,337,057
Mill supplies and other materials used.....	2,839		2,120,137	1,749		1,189,959
Total.....			30,193,428			16,527,016
PLANING MILLS AND REMANUFACTURES: (c)						
Rough lumber (finished or remanufactured at planing mills connected with saw mills).	361	1,340,216,922	17,001,751	116	259,134,498	3,480,647
All other materials used in remanufacture.....	320		211,732	102		50,043
Total.....			17,213,483			3,530,690
LOGGING, LUMBER MILLS AND SAW MILLS, AND PLANING MILLS AND REMANUFACTURES.	WISCONSIN. (542 establishments reported.)			MINNESOTA. (315 establishments reported.)		
	Establish- ments reporting respective items.	Quantity.	Value. (a)	Establish- ments reporting respective items.	Quantity.	Value. (a)
AGGREGATE VALUE OF MATERIALS USED.....			27,233,838			11,593,112
LOGGING: (b)						
Quantity and value of standing timber cut during year by milling es- tablishments.	389	2,103,511,765	7,526,550	88	559,830,406	1,576,918
Logging supplies used (exclusive of supplies included in report of wages and subsistence).	251		414,218	41		62,521
Transportation of logs to mill (exclusive of items reported under head of "Labor and wages").			1,549,983			348,435
Total.....			9,490,751			1,987,894
LUMBER MILLS AND SAW MILLS: (c)						
Quantity and cost of logs or bolts purchased.....	510	1,112,920,122	7,949,933	201	609,588,423	4,785,401
Mill supplies and other materials used.....	787		673,927	303		236,251
Total.....			8,623,860			5,041,652
PLANING MILLS AND REMANUFACTURES: (c)						
Rough lumber (finished or remanufactured at planing mills connected with saw mills).	185	713,693,833	8,995,042	60	367,388,591	4,526,062
All other materials used in remanufacture.....	165		124,185	53		37,504
Total.....			9,119,227			4,563,566

a Stumpage stated at its estimated value ; all other materials stated at actual cost.

b Quantities given in feet, scaled measure.

c Quantities given in feet, board measure.

TABLE 12.—LUMBER MILLS AND SAW MILLS—Continued.

MANUFACTURED PRODUCTS. (a)

CLASS OF PRODUCTS.	AGGREGATE. (3,071 establishments reported.)			MICHIGAN. (1,914 establishments reported.)		
	Establishments reporting respective items.	Quantity.	Value.	Establishments reporting respective items.	Quantity.	Value.
AGGREGATE VALUE OF ALL PRODUCTS (b).....	3,071		\$146,430,370	1,914		\$74,050,779
FOREST PRODUCTS:						
Saw logs for domestic consumption (feet, scaled measure).....	630	1,108,827,941	8,648,049	474	671,833,149	5,281,206
Telegraph poles (number).....	375	70,819	68,331	230	54,999	53,624
Fence posts (number).....	598	5,626,310	225,921	418	1,505,940	127,140
Railway ties (number).....	649	1,226,469	276,627	442	714,132	177,645
Piling (pieces).....	246	33,205	54,250	157	12,305	27,500
Hewed timber (feet, board measure).....	3	67,015	1,200	2	37,015	600
Round timber, for export (feet, scaled measure).....	10	4,099,000	27,651	8	3,709,000	24,960
All other products which have not become the material of the mill.....	479		316,719	389		216,909
Total.....			9,618,748			5,909,584
LUMBER-MILL AND SAW-MILL PRODUCTS:						
Sawed lumber (feet, board measure).....	2,217	8,093,917,775	93,729,688	1,321	4,257,600,247	49,925,094
Bobbin and spool stock (feet, board measure).....	32	4,685,660	57,164	31	4,185,600	49,164
Furniture stock (feet, board measure).....	587	32,252,134	419,167	414	20,239,343	276,540
Carriage and wagon stock (feet, board measure).....	585	17,503,241	213,758	399	12,715,764	149,562
Agricultural implement stock (feet, board measure).....	385	3,926,337	52,714	238	2,989,547	40,685
Pickets or palings (feet, board measure).....	488	49,137,597	231,431	349	13,509,360	70,385
Shingles (number).....	1,205	4,667,707,000	8,144,122	736	2,841,213,000	5,171,035
Staves (pieces).....	196	312,361,783	1,788,007	156	247,874,761	1,413,693
Headings (sets).....	407	40,353,993	991,716	365	32,085,238	663,581
All other products (including receipts from custom sawing) (c).....	2,016		10,071,237	1,260		6,024,244
Total.....			115,699,004			63,782,983
PLANING-MILL PRODUCTS AND REMANUFACTURES.....	385		21,112,618	130		4,358,206

CLASS OF PRODUCTS.	WISCONSIN. (842 establishments reported.)			MINNESOTA. (315 establishments reported.)		
	Establishments reporting respective items.	Quantity.	Value.	Establishments reporting respective items.	Quantity.	Value.
AGGREGATE VALUE OF ALL PRODUCTS (b).....	842		51,908,767	315		20,470,830
FOREST PRODUCTS:						
Saw logs for domestic consumption (feet, scaled measure).....	137	289,226,998	2,153,154	19	147,767,794	1,213,689
Telegraph poles (number).....	123	5,189	3,706	22	10,631	11,001
Fence posts (number).....	153	509,453	29,454	25	3,610,917	69,327
Railway ties (number).....	174	333,139	52,272	33	159,198	46,710
Piling (pieces).....	70	13,938	20,128	19	6,962	6,622
Hewed timber (feet, board measure).....	1	40,000	600			
Round timber, for export (feet, scaled measure).....	2	390,000	2,691			
All other products which have not become the material of the mill.....	74		99,352	16		458
Total.....			2,361,357			1,347,807
LUMBER-MILL AND SAW-MILL PRODUCTS:						
Sawed lumber (feet, board measure).....	657	2,812,564,872	31,873,910	239	1,023,752,656	11,930,684
Bobbin and spool stock (feet, board measure).....				1	500,000	9,000
Furniture stock (feet, board measure).....	152	11,039,772	129,976	21	973,019	12,651
Carriage and wagon stock (feet, board measure).....	152	4,171,461	52,436	34	616,016	11,760
Agricultural implement stock (feet, board measure).....	127	855,632	10,936	20	81,158	1,093
Pickets or palings (feet, board measure).....	116	32,885,699	150,818	23	2,742,538	10,228
Shingles (number).....	371	1,366,022,000	2,186,643	98	460,472,000	786,444
Staves (pieces).....	38	58,187,022	363,714	2	6,300,000	10,600
Headings (sets).....	41	7,818,735	312,135	1	450,000	16,003
All other products (including receipts from custom sawing) (c).....	550		3,029,103	206		1,017,890
Total.....			38,109,671			13,806,850
PLANING-MILL PRODUCTS AND REMANUFACTURES.....	193		11,437,739	62		5,316,673

(a) The table embraces only those forest products of mill establishments engaged in logging which have not become the material of the mill.

(b) The value of product is the net value at the mill, exclusive of expenses of selling. The cost of this item is stated under the head of "Annual expense charges," and should not be considered as a charge on the cost of manufacture.

(c) See Note 2 to Table 12, page 15.

NOTES TO TABLE 12.

NOTE 1.—The aggregate amount of invested capital shown in Table 12 includes that reported by establishments not in operation during the census year. These idle establishments are distributed as follows in the respective states, and the total amount of their capital should be deducted from the aggregate reported for each state if it is desired to ascertain the amount of capital actively employed in the industry :

STATES.	Idle establishments.	Capital.
Total.....	69	\$761,016
Michigan.....	43	367,711
Wisconsin.....	21	192,980
Minnesota.....	5	200,325

NOTE 2.—The amount reported as "All other products" in Table 12 includes the following :

CUSTOM SAWING.	MICHIGAN.		WISCONSIN.		MINNESOTA.	
	Number of establishments.	Receipts from custom work.	Number of establishments.	Receipts from custom work.	Number of establishments.	Receipts from custom work.
Total.....	1,174	\$3,099,635	525	\$823,079	190	\$566,165
Establishments engaged exclusively in custom sawing.....	200	1,457,121	94	430,847	55	198,349
Establishments engaged partially in custom sawing.....	974	1,642,514	431	392,232	135	367,816
SPECIAL INDUSTRIES AND BY-PRODUCTS.						
		Value of product.		Value of product.		Value of product.
Total.....	101	2,924,609	45	2,206,024	22	451,725
Handles, chair stock, and similar turned and shaped goods.....	34	476,698	13	41,884	1	7,500
Tubs, pails, churns, packages, miscellaneous wooden ware, and veneers.....	46	979,450	9	999,738	2	11,475
Hoops.....	13	337,026	3	28,655		
Paving blocks.....	2	30,200			1	20,000
Hubs, spokes, and similar wagon stock, in shape.....	2	169,284	11	380,240	1	20,000
Agricultural implement stock, in shape.....	1		1	5,700		
Miscellaneous.....	4	6,351	8	74,244	17	48,001
Estimated value of laths.....		750,000		550,000		247,000
Estimated value of other by-products.....		175,000		125,563		97,749

CLASSIFICATION AND ANALYSIS OF REPORTS.

There is found to be so wide a range in the productive capacity of lumber mills that, in order to obtain results of any value, it is necessary to classify the reports of such establishments as follows: Class 1 includes only those establishments which reported a consumption of over five million feet of standing timber, logs, or bolts, Class 2 those which reported a consumption of over one million and not more than five million feet, and Class 3 those which reported a consumption of one million feet or less.

The term "productive labor" includes only hands employed in such labor in and about the mill as would properly constitute a charge on the direct cost of the manufacture. The term "unproductive labor" includes all other wage laborers employed in the handling and care of the product at the mill. The term "salaried labor" includes all salaried profit sharers and employes not exclusively engaged in the sales department.

The tendency of all productive industry to centralization for purposes of economy and effectiveness is especially noted in the manufacture of lumber. Previous to the year 1870 the product of the lumber mill was usually forwarded to distributing centers, there to be manipulated and prepared for sale to the retail dealer. The extension of railway facilities and closer competition has caused a corresponding increase of direct distribution from the mill, thus raising the expense for handling in the yard at the point of production. The majority of manufacturers included in Class 1 may be said to be merchants as well, and a very large portion of the labor reported by them is therefore not a charge upon the cost of manufacture, but is employed in the mercantile branch of the business, and is part of the expense of selling. This fact should be noted in explanation of the excessive proportion of non-productive labor reported by

establishments of the class referred to, as illustrated in the following table respecting labor employed and average daily wages paid :

TABLE 13.—AVERAGES, BY CLASSIFIED ESTABLISHMENTS, OF LABOR EMPLOYED AND WAGES PAID IN LUMBER MILLS.

STATES AND CLASSES.	PRODUCTIVE AND SKILLED WAGE LABORERS EMPLOYED.			NON-PRODUCTIVE AND UNSKILLED WAGE LABORERS EMPLOYED.			Number of hours in ordinary day of labor.
	Number per establishment.	Rate of wages per hand per day.	Number of days employed.	Number per establishment.	Rate of wages per hand per day.	Number of days employed.	
MICHIGAN :							
Class 1.....	39.64	\$2.21	215.60	72.33	\$1.23	221	10.09
Class 2.....	15.15	1.51	196.00	5.40	1.14	186	
Class 3.....	6.54	1.25	112.50				
WISCONSIN AND MINNESOTA:							
Class 1.....	41.87	2.24	176.00	60.26	1.49	191	a10.46 b10.06
Class 2.....	17.50	1.56	137.72	6.24	1.27	152	
Class 3.....	6.76	1.52	89.50				

a 10.46 for all classes in Wisconsin.

b 10.06 for all classes in Minnesota.

The following analysis of reports from the several classes of establishments will elucidate the preceding statement still further :

TABLE 14.—AVERAGES OBTAINED FROM REPORTS OF LUMBER MANUFACTURERS.

LOGGING AND LUMBER MILLS.	MICHIGAN.			WISCONSIN AND MINNESOTA.		
	Average for establishments of—			Average for establishments of—		
	Class 1.	Class 2.	Class 3.	Class 1.	Class 2.	Class 3.
LOGGING (conducted by mill establishments):						
Quantity of standing timber cut (feet, board measure).....	22,476,755	2,209,808	434,210	14,555,687	2,305,556	321,818
Value of stumpage per 1,000 feet (board measure).....	\$4.49	\$2.11	\$2.75	\$3.65	\$2.49	\$2.16
Quantity cut per hand employed (feet, board measure).....	142,663	109,249	56,896	103,040	67,590	45,974
Wages per hand employed in woods.....	\$279.84	\$201.64	\$139.14	\$181.17	\$168.57	\$100.02
Average number of weeks employed per hand.....	33.13	33.67	22.16	23.61	25.62	13.14
Average cost of transportation per 1,000 feet.....	\$1.25	\$1.57	\$1.72	\$0.81	\$1.00	\$1.64
LUMBER MILLS:						
Average cost at mill per 1,000 feet of logs bought.....	\$8.07	\$5.79	\$6.40	\$7.83	\$6.62	\$5.47
Daily quantity of mill products in feet (board measure)...	99,011	12,361	3,621	87,817	16,576	3,298
Daily quantity of product per hand employed in direct production (feet, board measure).....	2,498	816	554	2,097	947	488
Value of product per 1,000 feet (a).....	\$11.54	\$10.24	\$10.13	\$11.25	\$9.98	\$10.75
Cost of productive wage labor per 1,000 feet of product....	\$5.7 cents.	\$1.90	\$2.39	\$1.02	\$1.69	\$2.63
Cost of non-productive wage labor per 1,000 feet of product.....	\$9.1 cents.	48.6 cents.	(b)	\$1.06	53.8 cents.	(b)
Cost of salaried labor (officers, firm members, and clerks) per 1,000 feet of product.....	24.6 cents.	33.7 cents.	33.2 cents.	30.6 cents.	39.1 cents.	38.5 cents.
Miscellaneous expenses (exclusive of commissions and expenses of selling) in \$100 of product.....	\$7.24	\$4.48	\$4.23	\$7.99	\$5.35	\$3.89
Wages and salaries paid in \$100 of product.....	\$17.28	\$26.57	\$26.86	\$21.21	\$26.19	\$28.08
Materials used in \$100 of product.....	\$65.52	\$57.19	\$46.66	\$60.46	\$61.15	\$47.40

a This item includes all mill products.

b No non-productive labor reported by establishments of Class 3.

In connection with the last item of the foregoing table particular attention is called to the fact that the reports of many establishments engaged in logging from their own lands show, under the head of "Materials used," the market value of standing timber cut, and not its actual cost, so that no reliable computation of actual net profits or ratio of profit to capital can be made. It is evident from analyses of reports from the states under consideration that the profits of manufacturing establishments of Class 1 are but slight in comparison with the unearned increment resulting from judicious investments in standing timber by such establishments. The results, as shown by the returns, simply indicate the relative value of product as compared with the combined cost of labor, miscellaneous expenses, and supplies consumed, added to the market value of "stumpage" or standing timber owned.

It was not considered practicable to obtain the actual cost of standing timber by means of individual returns, but full reports were obtained as to the capital invested in timbered lands and standing timber and the estimated product of merchantable timber and its value. A summary of these reports will be found in Table 45.

The returns for establishments of Class 1 show white pine cut almost exclusively, while those of Classes 2 and 3 show a large consumption of hemlock and hard-wood timber having comparatively low stumpage value. The difference in value of stumpage seems, however, to be entirely out of proportion to the difference in value of the manufactured product as reported by establishments in the respective classes. The abnormally low average value of product shown for establishments of Class 2 in Wisconsin and Minnesota is explained by the fact that the product of this class of mills in the state of Wisconsin consists largely of sawed shingles, the value of which is reported to be 13.75 per cent less than similar product in Michigan.

Attention is also called to the exhibit of "miscellaneous expense" items entering into the cost of manufacture. Such items were not included, and have not been considered in any form in the reports of previous censuses, so that any deduction or calculation as to cost of production based upon such reports would be entirely erroneous, and can not therefore be used in this respect for comparison with this report, which is intended to embrace all the essential elements of the cost of manufacture.

It should be noted that the value of product as called for by the schedule of questions is the net value at the mill, not including commissions or other expenses of selling. The cost of the latter item is stated in Table 12 under the head of "Annual expense charges," and should be added to the value of product reported in that table if its gross value is desired.

The following table shows the average division of capital employed by lumber manufacturers operating the respective classes of mills:

TABLE 15.—AVERAGE DIVISION OF CAPITAL INVESTED.

LUMBER MILLS.	CLASS 1.	CLASS 2.	CLASS 3.
	Average per establishment.	Average per establishment.	Average per establishment.
Capital invested in timbered land tributary to mill.....	\$231,398	\$5,756	.....
Capital reported in items under head of logging.....	65,293	2,555	\$921
Capital invested in saw-mill plant.....	65,763	7,246	2,227
Capital invested in planing-mill plant.....	31,972	1,331	.....
Capital invested in dry kilns.....	2,588	.....	.....
Total.....	397,014	16,868	3,148
Live capital.....	182,492	10,450	579
Total capital.....	579,506	27,318	3,727

The following table gives the average annual expenditure for miscellaneous items by lumber manufacturers operating the respective classes of mills:

TABLE 16.—AVERAGE ANNUAL EXPENDITURE FOR MISCELLANEOUS ITEMS, ETC.

LUMBER MILLS.	CLASS 1.	CLASS 2.	CLASS 3.
	Average per establishment.	Average per establishment.	Average per establishment.
Amount paid for taxes.....	\$5,447	\$244	\$90
Value of taxable property reported.....	485,433	24,783	2,900
Amount paid for insurance.....	3,559	418	8
Value of insurable property reported.....	129,089	18,708	2,600
Amount paid for expenses of selling.....	3,575	546	15
Value of goods manufactured.....	332,359	26,010	4,076
Amount paid for interest on cash used in the business.....	6,881	473	26
Total of capital employed.....	579,506	27,318	3,727
Amount paid for ordinary repairs.....	4,060	427	90
Value of buildings and machinery.....	54,988	5,931	1,900
Amount paid for sundry items not elsewhere included.....	6,457	276	25

The average amount paid for rent by lumber manufacturers appears to be inconsiderable.

The amount paid for taxes is shown to average 1.122 per cent of the total value of taxable property owned by establishments of Class 1, while for establishments of Class 2 the average drops to 0.985 per cent, and for Class 3 it is 1.034 per cent.

The amount paid for insurance premiums averages 2.757 per cent of the total value of insurable property reported as owned by establishments of Class 1, for establishments of Class 2 the premium amounts to 2.234 per cent of the reported value, and for establishments of Class 3 the amount of premium paid is inconsiderable.

The fire loss to lumber-mill and saw-mill establishments of all classes during the year 1889, as compiled and published by the Insurance Chronicle of New York, is placed in comparison in the following table with the total cost of insurance reported by such establishments in the respective states for the census year :

TABLE 17.—COMPARISON OF FIRE LOSS WITH COST OF INSURANCE.

STATES.	FIRE LOSS TO LUMBER MILLS AND SAW MILLS, 1889. (a)			INSURANCE COST TO LUMBER MILLS AND SAW MILLS, CENSUS YEAR 1890. (b)				
	Total number of losses.	Total property loss.	Total insurance loss.	Number of establish- ments in each state.	Number of establish- ments reporting in- surance.	Amount paid for fire insurance on mill property.	Amount paid for other insurance.	Total cost of insurance.
Total	68	\$523,500	\$247,200	3,140	1,508	\$768,565	\$671,722	\$1,440,287
Michigan.....	31	248,500	129,200	1,957	914	342,743	331,286	674,029
Wisconsin.....	31	241,000	109,500	863	486	282,848	247,128	529,976
Minnesota.....	6	34,000	8,500	320	108	142,974	93,308	236,282

a As reported by the Insurance Chronicle.

b As shown by manufacturers' returns.

The insurance loss on various classes of property, a portion of which might be included in the risks covered by the amount reported in the preceding table as "paid for other insurance," is stated in the publication referred to as follows :

TABLE 18.—INSURANCE LOSS ON VARIOUS CLASSES OF PROPERTY.

CLASSES.	Michigan insurance loss.	Wisconsin insurance loss.	Minnesota insurance loss.
Total	\$149,130	\$211,600	\$216,900
Cooperage.....	26,300		20,200
Cord wood and timber.....	12,000		
Lumber camps.....			6,000
Lumber on wharves.....	17,500		
Lumber yards.....	84,330	136,300	185,200
Lumber warehouses and storage.....	8,000	1,000	5,500
Wooden-ware factories.....		74,300	
Wood turning.....	1,000		

The expense of selling is shown to average 1.08 per cent of the total net value of product at the mill for establishments of Class 1, for establishments of Class 2 it is 2.10 per cent, and for Class 3 it is inconsiderable.

The average amount of borrowed capital employed, computed on a basis of 6 per cent as the average annual interest charge, is found to be as follows : Class 1, \$114,683 ; Class 2, \$7,883 ; Class 3, \$433.

The average cost of ordinary repairs to buildings and machinery shows the following percentage on the total value of buildings and machinery owned by the respective classes of establishments : Class 1, 7.38 ; Class 2, 7.20 ; Class 3, 4.74.

TABLE 19.—MICHIGAN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY COUNTIES. (a)

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Alcona	1880	4	\$140,000	21,957,000	6,686,000					\$211,792	
	1890	10	229,256	19,568,000	11,000,000		1,000	\$930		205,939	\$217,695
Allegan	1880	54	338,235	61,030,000	15,556,000	1,025,000	1,025,000			762,473	
	1890	40	247,546	12,323,000	6,163,000	3,308,000	201,000	26,716	\$2,950	181,356	193,149
Alpena	1880	18	747,250	121,650,000	54,250,000					1,330,805	
	1890	17	3,435,638	209,277,000	34,567,000			176,678		2,717,282	2,819,732
Antrim	1880	6	60,400	3,550,000	500,000					35,700	
	1890	23	579,544	21,524,000	1,150,000		1,600	290,282	1,925	492,524	493,148
Arenac (b)	1880										
	1890	16	235,405	22,687,000	14,604,000			6,150		280,544	281,011
Baraga (c)	1880										
	1890	4	3,436,075	73,510,000	49,816,000			17,200		948,728	948,728
Barry	1880	26	42,950	6,460,000	6,000					67,005	
	1890	28	156,467	7,235,000	250,000	200,000		31,588	21,200	140,274	147,650
Bay	1880	46	4,088,500	485,160,000	61,544,000	17,068,000	2,032,000	15,250		5,832,307	
	1890	51	8,429,831	294,568,000	88,407,000	20,568,000	1,258,000	935,518	315,800	5,438,026	5,753,724
Benzie	1880	15	183,300	52,737,000	580,000					516,902	
	1890	18	402,851	29,858,000	22,726,000		1,000	18,540	11,150	379,608	387,578
Berrien	1880	41	301,050	38,381,000	2,240,000	6,815,000	568,000	700		565,597	
	1890	26	196,354	11,150,000	350,000	1,300,000	306,000	96,599	10,400	278,998	287,861
Branch	1880	30	83,200	14,305,000	290,000	2,337,000	175,000			183,618	
	1890	27	129,497	3,555,000	800,000	765,000	1,275,000	50,268	14,400	135,057	135,681
Calhoun	1880	13	40,300	5,500,000	4,000,000	850,000	175,000			75,500	
	1890	21	89,030	4,533,000	1,558,000	720,000	61,000	15,060		73,576	76,267
Cass	1880	29	97,700	13,001,000	400,000	100,000	200,000	400		149,455	
	1890	19	150,437	8,384,000	2,586,000	2,268,000	227,000	20,643	2,159	142,539	163,224
Charlevoix	1880	6	30,500	2,125,000	2,000,000					29,750	
	1890	27	901,533	59,173,000	22,003,000	473,000	29,000	78,427	62,661	791,723	824,007
Cheboygan	1880	7	771,000	57,000,000	1,500,000					504,500	
	1890	26	1,948,572	84,078,000	27,332,000	473,000	29,000	168,258	4,400	1,200,727	1,257,461
Chippewa	1880	3	310,000	12,000,000	100,000					132,700	
	1890	7	1,383,967	72,102,000	18,016,000	947,000	56,000	20,959	39,122	970,937	1,031,378
Clare	1880	5	14,000	9,000,000	21,500,000					143,250	
	1890	34	431,004	31,442,000	53,366,000		1,000	16,038	820	480,548	488,327
Clinton	1880	24	79,260	10,187,000						101,554	
	1890	13	87,240	8,424,000	2,866,000		2,000	5,646		109,787	108,761
Crawford	1880	4	15,200	3,475,000	13,000,000					59,750	
	1890	3	546,344	24,990,000	47,749,000			975	63,375	392,906	393,915
Delta	1880	6	550,000	34,550,000	12,500,000			15,000		395,350	
	1890	12	1,727,905	77,681,000	11,695,000			54,184	19,561	1,070,441	1,102,558
Eaton	1880	40	169,200	16,446,000	400,000	3,600,000	485,000	1,600		223,403	
	1890	37	183,558	8,950,000	2,280,000		3,000	29,070	100	145,389	155,661
Emmet	1880	8	159,500	11,600,000						139,100	
	1890	37	954,492	39,703,000	17,079,000	473,000	66,000	125,312	48,636	621,027	673,099
Genesee	1880	23	601,400	30,825,000	23,330,000	7,650,000	3,000,000	4,100		551,450	
	1890	24	170,756	11,631,000	1,258,000	283,000	151,000	60,950	1,770	223,473	225,228
Gladwin (c)	1880										
	1890	19	207,499	15,412,000	47,126,000			9,956		262,009	270,842

a See Table 20 for details of quantities and value of forest products for 1890.

b The following named counties have been formed since 1880, and therefore no reports are shown for that year: Alger county, formed in 1885 from Schoolcraft; Arenac county, formed in 1883 from Bay; Gogebic county, formed in 1887 from Ontonagon; Iron county, formed in 1885 from Marquette and Menominee; Luce county, formed in 1887 from Chippewa and Mackinac. No reports for either years were received from counties not mentioned in the table. No returns were received in 1880 from Montmorency county.

c The following named counties are grouped because there were less than three reports from each of them; the number of establishments reporting for the respective years is noted after each county name below:

1880: Baraga, 1; Gladwin, 1; Keweenaw, 1; Manitou, 1; Ogemaw, 1; Ontonagon, 1; Roscommon, 1; Schoolcraft, 2.

1890: Alger, 2; Gogebic, 2; Iron, 2; Luce, 1; Manitou, 1; Oscoda, 2; Roscommon, 2.

STATISTICS OF MANUFACTURES.

TABLE 19.—MICHIGAN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION, ETC.—Continued.

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Grand Traverse	1880	16	\$591,000	35,125,000	650,000			\$4,000		\$381,415	
	1890	39	736,282	54,787,000	42,698,000		2,000	17,034	\$108,000	\$13,661	\$938,383
Graatiot	1880	23	149,400	18,683,000	15,995,000	1,095,000	12,000	600		230,940	
	1890	41	428,519	19,121,000	23,125,000	21,500,000	2,637,000	75,211	2,000	549,506	553,862
Hillsdale	1880	36	82,100	7,680,000	990,000	2,475,000	149,000	3,760		113,230	
	1890	50	101,153	7,164,000	1,681,000	750,000	367,000	22,891	1,350	125,906	126,738
Houghton	1880	3	145,000	13,500,000	1,650,000			2,500		174,500	
	1890	6	1,040,581	40,777,000	10,796,000	473,000	28,000	8,817	66,561	653,287	741,629
Huron	1880	19	120,450	15,863,000	5,786,000	2,092,000	470,000			206,209	
	1890	25	165,107	11,702,000	5,989,000	2,000,000	201,000	19,048	1,500	157,084	158,434
Ingham	1880	37	203,000	21,385,000		3,665,000	882,000			267,085	
	1890	21	164,961	4,331,000	750,000	4,805,000	479,000	53,761		164,198	165,502
Ionia	1880	35	394,120	39,405,000	4,000,000	1,000,000	60,000	3,050		488,010	
	1890	26	168,615	16,416,000	2,116,000	100,000	101,000	9,915	11,250	207,637	214,287
Iosco	1880	20	1,243,300	181,640,000	13,635,000	3,388,000	164,000	14,000		1,997,070	
	1890	30	5,228,854	195,387,000	59,741,000	3,593,000	154,000	211,501	78,244	3,157,977	3,803,194
Isabella	1880	16	229,350	9,963,000	12,790,000			155		132,795	
	1890	43	644,588	41,754,000	83,175,000	473,000	519,000	26,526	37,061	710,922	747,510
Jackson	1880	6	19,500	730,000						8,665	
	1890	7	32,198	2,425,000	750,000		1,000	4,712		33,140	33,764
Kalamazoo	1880	9	67,300	3,837,000		425,000	100,000	1,360		65,624	
	1890	10	80,760	3,430,000	500,000		1,100,000	20,898		71,394	71,592
Kalkaska	1880	6	18,000	12,784,000	375,000					132,235	
	1890	18	458,449	28,832,000	13,354,000		1,000	61,910	167,500	543,220	548,383
Kent	1880	67	1,351,335	96,421,000	165,600,000			196,100		1,506,491	
	1890	41	2,281,702	67,413,000	23,113,000	1,250,000	771,000	243,076	237,250	1,424,130	1,566,274
Lake	1880	16	115,200	16,300,000	20,940,000			14,850		223,830	
	1890	12	1,269,536	63,222,000	19,392,000	473,000	29,000	19,742	483,461	1,302,722	1,393,011
Lapeer	1880	45	622,100	70,610,000	84,348,000			2,160		999,130	
	1890	16	103,020	4,230,000	3,100,000	1,300,000	5,000	2,800	28,305	86,236	86,444
Leelanaw	1880	8	64,500	6,770,000	280,000			1,750		69,174	
	1890	16	706,963	51,782,000	10,787,000	473,000	28,000	47,167	19,561	682,567	725,242
Lenawee	1880	45	179,414	18,406,000	725,000	10,000,000	2,930,000	3,200		330,965	
	1890	47	189,678	11,344,000	3,700,000	675,000	22,000	33,204	1,100	189,799	194,385
Livingston	1880	10	87,400	7,222,000		12,000,000	10,000			147,800	
	1890	12	72,610	3,343,000	750,000		1,000	20,860		70,588	71,212
Mackinac	1880	3	495,000	15,289,000	1,700,000					163,574	
	1890	9	603,946	31,024,000	37,779,000	473,000	28,000	7,842	19,561	444,375	534,366
Macomb	1880	16	161,860	8,300,000	50,000	30,750,000	2,030,000	9,400		314,050	
	1890	11	214,887	5,365,000	350,000	15,975,000	1,510,000	16,250		255,601	261,679
Mañistee	1880	28	2,607,500	222,991,000	347,726,000			22,150		2,722,580	
	1890	29	11,914,777	251,178,000	461,231,000	16,842,000	913,000	256,932	28,525	3,841,024	4,644,885
Marquette	1880	8	214,000	22,000,000	7,730,000					259,900	
	1890	12	872,676	52,295,000	17,824,000	473,000	29,000	74,533	39,122	782,425	848,673
Mason	1880	20	3,645,500	175,622,000	120,590,000			8,400		1,987,459	
	1890	31	5,438,281	161,005,000	89,532,000	8,450,000	841,000	100,785		2,122,207	2,554,729
Mecosta	1880	20	325,000	25,227,000	45,188,000			1,000		427,777	
	1890	40	593,146	50,675,000	85,561,000		1,000	41,698	132,100	887,300	1,106,206
Menominee	1880	12	1,492,000	169,944,000	62,532,000			65,450		1,916,163	
	1890	23	8,775,709	336,390,000	165,821,000			197,126	741,236	5,190,963	5,876,913
Midland	1880	17	141,800	8,050,000	96,350,000		800,000	30,000		328,535	
	1890	25	559,822	33,372,000	34,470,000	1,853,000	82,000	41,517	25,561	514,925	552,111
Missaukee	1880	4	11,000	1,050,000	150,000					12,500	
	1890	15	601,050	36,131,000	7,543,000			6,726	24,385	400,271	400,479
Monroe	1880	34	193,900	15,980,000	600,000	18,700,000	978,000	2,075		280,815	
	1890	35	241,873	10,614,000	1,866,000	2,970,000	300,000	29,320	32,300	229,100	235,933
Montcalm	1880	133	1,500,400	243,940,000	631,210,000	9,200,000	780,000	4,170		4,046,649	
	1890	58	1,303,149	56,179,000	187,268,000	2,873,600	53,000	32,346	29,561	1,160,014	1,215,442

LUMBER MILLS AND SAW MILLS.

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TABLE 19.—MICHIGAN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION, ETC.—Continued.

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Montmorency (a).....	1880										
	1890	3	\$12,400	1,280,000	250,000			\$150		\$14,396	\$14,604
Muskegon.....	1880	65	5,057,090	668,770,000	152,590,000			62,910		7,686,013	
	1890	61	10,066,451	457,329,000	405,163,000	2,739,000	1,203,000	585,825	\$26,561	6,038,416	6,180,881
Newaygo.....	1880	41	643,600	91,694,000	122,895,000	13,200,000	525,000	4,350		1,334,586	
	1890	50	1,881,185	114,092,000	86,349,000	4,232,000	87,000	51,784	275,300	1,838,793	1,844,445
Oakland.....	1880	13	31,000	4,770,000				50,000		59,796	
	1890	25	109,625	7,463,000	1,058,000		1,000	8,740	8,500	120,160	124,937
Oceana.....	1880	31	524,000	34,264,000	61,257,000	55,000		5,000		451,784	
	1890	41	570,672	36,254,000	53,540,000	3,415,000	226,000	53,125		514,883	526,274
Ogemaw (b).....	1880										
	1890	14	282,337	20,067,000	3,158,000		1,000	13,321	49,500	288,485	289,160
Ontonagon (b).....	1880										
	1890	3	2,105,136	50,024,000	53,229,000			19,842	19,561	768,726	798,817
Osceola.....	1880	25	370,900	28,760,000	27,990,000			500		387,135	
	1890	64	923,748	69,114,000	114,114,000	2,265,000	226,000	42,504	95,461	1,123,513	1,189,574
Otsego.....	1880	4	370,000	24,590,000	6,000,000					215,000	
	1890	15	144,084	9,365,000	17,784,000	6,500,000	1,000	17,546		176,503	177,904
Ottawa.....	1880	40	1,645,700	168,537,000	141,525,000	600,000	750,000	12,317		2,262,714	
	1890	34	1,116,031	55,063,000	7,723,000	9,771,000	636,000	48,058	57,853	892,457	894,940
Presque Isle.....	1880	4	23,900	700,000	250,000					8,450	
	1890	9	166,701	6,240,000	3,470,000		1,000	9,271	4,400	102,493	131,553
Saginaw.....	1880	83	2,578,900	378,904,000	185,793,000	17,675,000	1,286,000	39,616		4,758,439	
	1890	73	9,634,319	325,526,000	102,543,000	31,806,000	1,829,000	435,048	474,202	5,383,189	6,186,770
Saint Clair.....	1880	25	527,900	31,840,000	2,810,000	20,200,000	690,000	500		583,410	
	1890	21	573,978	18,761,000	5,401,000	16,136,000	592,000	20,854	4,000	379,194	411,869
Saint Joseph.....	1880	14	34,300	2,242,000		1,000,000	50,000	1,113		35,842	
	1890	13	42,407	5,374,000	1,058,000		1,000	4,027	50	47,354	49,127
Sanilac.....	1880	17	58,300	9,670,000	5,620,000			100		94,200	
	1890	23	79,863	4,538,000	7,710,000		2,000	4,735	300	60,452	61,700
Schoolcraft (b).....	1880										
	1890	10	6,887,945	92,933,000	5,672,000			122,925	170,000	1,590,213	1,850,780
Shiawassee.....	1880	22	88,800	11,740,000		500,000		1,050		128,380	
	1890	23	96,120	6,767,000	1,308,000		1,000	24,723		102,248	113,700
Tascola.....	1880	25	70,432	11,664,000	6,140,000	3,000,000	350,000			145,249	
	1890	35	375,636	20,608,000	10,783,000	15,031,000	1,198,000	74,642	7,000	434,467	438,161
Van Buren.....	1880	51	236,100	40,630,000	2,000,000	7,366,000	1,221,000	4,100		509,474	
	1890	48	323,518	18,379,000	3,566,000	5,965,000	683,000	58,986	9,150	332,435	341,149
Washtenaw.....	1880	18	38,700	3,906,000	5,000			450		47,134	
	1890	28	157,069	2,859,000	750,000	2,265,000	225,000	22,419	29,300	111,013	111,957
Wayne.....	1880	19	237,032	20,225,000		300,000	700,000	1,440		304,015	
	1890	29	1,367,803	37,825,000	1,750,000	20,250,000	11,242,000	297,831	60,900	1,166,195	1,173,781
Wexford.....	1880	18	672,400	94,500,000	3,800,000			200		946,150	
	1890	33	1,903,773	73,978,000	27,310,000	7,473,000	30,000	89,792	19,561	1,025,858	1,060,390
Other counties (b).....	1880	9	764,000	49,600,000	4,270,000					547,000	
	1890	12	1,237,303	73,935,000	48,345,000	475,000	29,000	58,001	111,183	1,177,159	1,270,373

a See note b, page 19.

b See note c, page 19.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in the preceding table. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 20.—MICHIGAN—QUANTITY AND VALUE OF FOREST PRODUCTS, BY COUNTIES.

COUNTIES.	Saw logs for domestic consumption. (Feet, scaled measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Hewed timber. (Feet, board measure.)	Round timber for export. (Feet, scaled measure.)	Value of all other forest products.	Total value of forest products which have not become the material for the mill product.
Alcona.....	120,000	2,825	15,250	17,900				\$3,510	\$11,756
Allegan.....	65,000	15	2,775	9,540	808			40	11,793
Alpena.....	16,500,000								102,450
Antrim.....	30,000			1,350				15	624
Arenac.....	45,000		525	640				30	467
Barry.....	10,000		225	15,450				505	7,356
Bay.....	27,047,000		400	3,190				25	315,698
Benzie.....	1,055,000		6,150	3,590				35	7,970
Berrien.....	260,000		5,125	19,150	400			5	8,863
Branch.....			375					15	624
Calhoun.....	75,000	20	900	5,960				45	2,691
Cass.....	235,000	39	1,318	45,569	11		9,000	67	20,685
Charlevoix.....	4,200,000		1,847	4,869				1,273	32,284
Cheboygan.....	5,030,000				77		2,750,000	1,573	56,734
Chippewa.....	7,783,000		1,194	988	114			2,401	60,441
Clare.....	2,607,000		12,375	2,300				140	7,779
Clinton.....	141,000		1,675	3,530				85	1,974
Crawford.....	35,000		400	190	508			25	1,009
Delta.....	3,954,000		21,322	3,229	69			1,243	32,117
Eaton.....	90,000	45	1,125	15,050				45	10,272
Emmet.....	4,019,000	35	1,272	3,549				21,223	52,072
Genesee.....	225,000		950	1,190				35	1,755
Gladwin.....	572,000		2,525	3,090	48		50,000	555	8,833
Grand Traverse.....	4,491,000		13,475	19,530	32			16,980	124,722
Gratiot.....	755,000	25	7,625	3,200	40			155	4,356
Hillsdale.....	40,000	20	500	1,800				20	832
Houghton.....	12,909,000		797	4,038	61			1,213	88,342
Huron.....	111,000			2,180	16			70	1,350
Ingham.....			875	2,950				15	1,304
Ionia.....	136,000		1,300	14,950				70	6,650
Iosco.....	77,220,000	10	3,038	3,366	236			4,837	645,217
Isabella.....	5,140,000		5,897	3,349	93			1,333	36,588
Jackson.....	50,000							15	624
Kalamazoo.....	30,000		125					5	208
Kalkaska.....	65,000		6,775	4,540				3,540	5,163
Kent.....	20,159,000		1,050	3,883				60	142,144
Lake.....	12,884,000		5,522	2,599	53			1,193	90,289
Lapeer.....	10,000			450				5	208
Leelanaw.....	4,252,000		10,797	10,589	261			9,713	42,675
Lenawee.....	130,000	65	1,625	8,850	100			65	4,586
Livingston.....	50,000							15	624
Mackinac.....	3,874,000	10,500	425,397	117,399			700,000	1,188	89,991
Macomb.....			1,525	9,750	1,400	15,000		5	6,078
Manistee.....	106,754,000		1,447	6,179	69			25,663	803,861
Marquette.....	8,328,000	1,005	2,719	1,628	122	12,000	10,000	2,431	66,248
Mason.....	57,221,000		4,250	14,660	482			110	432,522
Mecosta.....	27,124,000		1,850	1,660	32			4,110	218,906
Menominee.....	86,580,000	17,205	639,431	140,830	5,516			12,055	685,950
Midland.....	3,949,000	5,020	16,297	6,689	61			1,233	37,186
Missaukee.....	20,000							5	208
Monroe.....	591,000		2,125	870				1,055	6,833
Montcalm.....	5,940,000	30	33,944	3,951	77			1,293	55,428
Montmorency.....	28,000							5	208
Muskegon.....	16,019,000		15,897	19,579	69			1,808	142,465
Newaygo.....	286,000		1,575	4,620	24			90	5,652
Oakland.....	365,000		950	2,290	473			35	4,777
Ocean.....	1,247,000		16,875	9,100	40			3,260	11,391
Ogemaw.....	55,000							35	675
Ontonagon.....	3,874,000		397	399	53			1,188	30,091
Osceola.....	7,186,000		13,422	11,089	101		100,000	16,363	66,061

TABLE 20.—MICHIGAN—QUANTITY AND VALUE OF FOREST PRODUCTS, BY COUNTIES—Continued.

COUNTIES.	Saw logs for domestic consumption. (Feet, scaled measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Hewed timber. (Feet, board measure.)	Round timber for export. (Feet, scaled measure.)	Value of all other forest products.	Total value of forest products which have not become the material for the mill product.
Otsego.....	136,000		1,575	1,920				\$90	\$1,401
Ottawa.....	255,000	40	1,400	3,790				65	2,483
Presque Isle.....	2,748,000		47,250	30,400				10	29,060
Saginaw.....	58,570,000	18,030	79,142	4,258	138			62,506	803,581
Saint Clair.....	3,555,000			1,090				1,535	32,675
Saint Joseph.....	155,000		1,650		38			35	1,773
Sanilac.....	60,000		745	2,700				30	1,248
Schoolcraft.....	45,727,000		40,525	20,640				30	260,567
Shiawassee.....	115,000		775	30,427				455	11,452
Tuscola.....	497,000		7,250	1,950				335	3,694
Van Buren.....	811,000			4,310	516		10,000	1,420	8,714
Washtenaw.....	60,000	15	485	1,400				15	944
Wayne.....	320,000	35	5,875	4,150			80,000	35	7,586
Wexford.....	4,849,000		1,297	2,389				1,833	34,532
Other counties (a).....	11,697,000		2,091	7,387	167			4,389	93,214

a The following named counties are grouped because there were less than three reports from each of them; the number of establishments reporting is noted after each county named: Alger, 2; Gogebie, 2; Iron, 2; Luce, 1; Manistow, 1; Oscoda, 2; Roscommon, 2.

TABLE 21.—MICHIGAN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY SECTIONS. (a)

SECTIONS.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Saginaw Bay shore.....	1880	141	\$6,879,182	918,595,000	200,078,000	37,569,000	3,767,000	\$61,366		\$11,079,721	
	1890	192	23,276,886	825,107,000	262,759,000	54,694,000	3,622,000	1,644,840	\$834,935	14,132,657	\$15,870,548
Lake Huron shore.....	1880	75	2,268,350	242,817,000	71,116,000	20,200,000	690,000	600		2,733,157	
	1890	106	6,431,008	342,461,000	89,480,000	16,609,000	625,000	380,726	13,100	4,666,087	4,900,010
Lake Michigan shore.....	1880	390	15,449,375	1,522,557,000	847,294,000	15,861,000	3,564,000	121,327		18,122,131	
	1890	471	34,150,195	1,259,508,000	1,146,711,000	53,309,000	5,136,000	1,803,788	386,872	17,988,886	19,672,407
Upper Peninsula.....	1880	40	3,844,000	307,983,000	90,482,000			82,950		3,501,187	
	1890	93	27,730,112	877,799,000	407,136,000	2,366,000	141,000	572,112	1,206,346	13,279,741	14,655,270
Interior counties north of Lansing.	1880	603	9,050,665	1,010,613,000	1,368,281,000	39,899,000	4,962,000	239,785		11,339,750	
	1890	675	16,254,683	872,155,000	912,690,000	69,349,000	5,744,000	941,236	1,745,564	14,834,919	15,655,842
Interior counties south of Lansing.	1880	400	1,768,856	170,007,000	7,466,000	86,292,000	8,914,000	25,378		2,673,982	
	1890	420	3,456,913	134,210,000	22,437,000	51,648,000	16,817,000	681,512	171,359	3,218,899	3,296,696

a See Table 23 for details of quantity and value of forest products in 1890.

NOTE.—In the preceding table the term "Saginaw Bay shore" embraces the counties of Arenac, Huron, Tuscola, Bay, and Iosco; also the city of Saginaw and the town of Zilwaukee.

The term "Lake Huron shore" embraces the counties of Sanilac, Saint Clair, Alcona, Alpena, Presque Isle, and Cheboygan.

The term "Lake Michigan shore" embraces the counties of Emmet, Charlevoix, Antrim, Grand Traverse, Leelanaw, Benzie, Manistee, Mason, Oceana, Muskegon, Ottawa, Allegan, Van Buren, Berrien, and Manistow.

The counties in the "Upper Peninsula" are Mackinac, Chippewa, Schoolcraft, Delta, Menominee, Marquette, Baraga, Houghton, Keweenaw, Ontonagon, Gogebie, Luce, Iron, and Alger.

The interior counties north of Lansing are Otsego, Montmorency, Kalkaska, Crawford, Oscoda, Wexford, Roscommon, Lake, Clare, Newaygo, Isabella, Kent, Ionia, Mecosta, Midland, Montcalm, Gratiot, Clinton, Saginaw (except the city of Saginaw and the town of Zilwaukee), Shiawassee, Genesee, Lapeer, Missaukee, Ogemaw, Osceola, and Gladwin.

The interior counties south of Lansing embrace all counties not named above.

It will be seen by the following table, showing for each section of the state its percentage of the total value of mill production and remanufactures in the state of Michigan, that the relative rank of the respective sections is the same in 1890 that it was in 1880:

TABLE 22.—MICHIGAN—PERCENTAGE OF TOTAL VALUE OF MILL PRODUCTION AND REMANUFACTURES.

SECTIONS.	PER CENT.	
	1880.	1890.
Lake Michigan shore	34.55	26.40
Interior counties north of Lansing	27.34	21.80
Saginaw Bay shore.....	21.12	20.74
Upper Peninsula.....	6.68	19.49
Lake Huron shore	5.21	6.85
Interior counties south of Lansing.....	5.10	4.72

Although no change in relative rank has taken place, some sections show a decrease in their ratio to the whole. A marked increase is noted in the Upper Peninsula, which advances 12.81 per cent in its ratio to the entire product and shows an increase over its product for 1880 of 279.29 per cent.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in Table 21. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 23.—MICHIGAN—QUANTITY AND VALUE OF FOREST PRODUCTS, BY SECTIONS.

SECTIONS.	Saw logs for domestic consumption. (Feet, sealed measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Hewed timber. (Feet, board measure.)	Round timber for export. (Feet, sealed measure.)	Value of all other forest products.	Total value of forest products which have not become the material for the mill product.
Saginaw Bay shore	159,450,000	18,045	89,308	11,915	369	.....	.....	\$66,510	\$1,737,891
Lake Huron shore	28,013,000	1,270	65,742	53,959	85	.....	2,750,000	6,658	233,923
Lake Michigan shore.....	200,726,000	260	83,485	127,785	2,823	.....	10,000	81,610	1,683,521
Upper Peninsula	180,777,000	28,720	1,132,576	291,500	5,602	12,000	710,000	24,925	1,375,529
Interior counties north of Lansing	100,638,000	6,365	114,401	109,264	1,380	.....	150,000	35,214	800,923
Interior counties south of Lansing.....	2,229,000	339	20,428	119,709	2,046	15,000	89,000	1,992	77,797

Table 24, on the following page, shows totals of capital invested and production at the principal productive points in the state of Michigan for the census years 1880 and 1890, and embraces all cities and towns for which special agents were appointed in 1890 and which contain three or more establishments reporting an aggregate value of production of \$20,000 or over.

TABLE 24.—MICHIGAN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY PRINCIPAL LUMBER-PRODUCING POINTS. (a)

CITIES.	Year.	Number of establishments.	RANK ACCORDING TO—		Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
			Capital invested.	Value of products. (b)									
Adrian	1880	3	16	16	\$7,500	1,051,000						\$12,010	
	1890	6	20	20	43,742	2,830,000	250,000	600,000	1,000	\$12,346		55,086	\$55,649
Alpena	1880	13	8	7	683,000	114,500,000	38,000,000					1,230,375	
	1890	14	8	5	3,389,128	209,276,000	34,567,000			176,678		2,717,282	2,819,732
Bay City (c)	1880	22	2	2	3,042,000	233,116,000	11,187,000	12,416,000	987,000	14,411		3,702,298	
	1890	22	3	2	6,708,293	234,747,000	33,839,000	9,294,000	387,000	580,905	\$315,800	4,006,214	4,300,053
Big Rapids	1880	3	14	14	92,500	4,827,000	10,000,000					104,102	
	1890	6	19	19	62,802	5,923,000	10,851,000			1,854		75,064	79,323
Cadillac	1880	7	10	11	588,000	69,700,000	500,000					699,000	
	1890	10	11	13	1,381,530	40,984,000	3,250,000			54,325		527,269	530,827
Detroit (d)	1880												
	1890	9	12	11	1,174,793	24,759,000		19,250,000	11,240,000	271,147	20,000	897,984	897,984
Escanaba (e)	1880												
	1890	3	14	14	692,881	31,000,000				43,842		488,842	488,842
Flint	1880	6	11	12	519,000	25,700,000	14,100,000	5,000,000	3,000,000	4,000		467,500	
	1890	5	18	18	81,970	7,105,000	290,000			25,575		123,671	124,229
Grand Haven	1880	7	12	9	478,000	45,200,000	120,000,000					825,000	
	1890	4	16	15	335,870	29,100,000		5,971,000	398,000	17,989		461,807	461,807
Grand Rapids	1880	8	6	10	1,014,685	63,819,000	350,000			191,000		755,476	
	1890	12	9	9	1,902,319	58,968,000			120,000	236,973	73,250	1,079,602	1,219,602
Greenville	1880	4	13	13	109,500	13,600,000	9,800,000					166,250	
	1890	3	15	16	492,900	18,386,000	750,000			12,500		209,690	227,190
Ionia (d)	1880												
	1890	5	25	22	8,895	3,084,000				3,085		39,849	39,849
Jackson (e)	1880												
	1890	3	22	24	24,673	1,980,000	500,000		1,000	3,792		27,244	27,660
Kalamazoo	1880	3	15	15	39,500	850,000		425,000			1,310	32,535	
	1890	3	23	25	16,710	1,740,000						25,560	25,560
Ludington	1880	6	3	8	2,932,700	108,500,000	18,000,000			3,600		1,130,600	
	1890	12	7	7	5,164,834	141,620,000	82,200,000	7,250,000	780,000	76,665		1,880,425	2,311,175
Manistee	1880	12	4	4	1,917,000	142,000,000	231,681,000			18,000		1,867,500	
	1890	9	6	6	5,197,684	132,414,000	279,886,000	9,918,000	485,000	103,040	8,964	2,030,570	2,326,772
Manistique (e)	1880												
	1890	3	5	8	5,834,000	68,750,000	4,864,000			97,500		1,065,650	1,318,650
Menominee	1880	4	5	6	1,155,000	127,000,000				450		1,294,834	
	1890	9	2	1	6,715,454	277,641,000	84,239,000			190,418	602,000	4,208,659	4,780,983
Midland (d)	1880												
	1890	8	17	17	148,350	10,933,000	20,941,000	80,000	41,000	1,581	6,000	162,889	163,534
Muskegon (e)	1880	27	1	1	3,916,790	492,507,000	26,340,000			5,000		5,651,877	
	1890	19	1	3	7,410,565	315,252,000	208,759,000		950,000	331,982	7,000	4,016,094	4,115,094
North Muskegon (f)	1880												
	1890	10	10	10	1,674,214	87,527,000	142,753,000			90,504		1,208,964	1,210,964
Owosso (g)	1880												
	1890	3	21	21	37,745	2,233,000	558,000			20,711		44,923	45,182
Pontiac (g)	1880												
	1890	3	24	23	15,850	1,041,000				3,800	8,500	29,455	29,455
Saginaw	1880	25	7	3	975,500	161,668,000	104,963,000	6,096,000	520,000	32,116		2,085,606	
	1890	23	4	4	6,581,548	180,936,000	40,080,000	8,305,000	394,000	269,291	432,391	3,128,599	3,771,705
West Bay City	1880	10	9	5	660,000	140,000,000	1,200,000	5,048,000	965,000			1,614,259	
	1890	10	13	12	980,817	47,041,000		3,013,000	407,000	237,582		822,077	822,077

a See Table 25 for details of quantity and value of forest products in 1880.

b Rank for 1890 is given according to aggregate value of all products, including the value of forest products manufactured by milling establishments, but which have not become the material for the mill product. The inquiry of 1880 did not include this branch of the industry.

c The township of Lakeside has been included within the corporate limits of the city of Muskegon since 1880, and the value of its product is therefore added to that of Muskegon for 1880 to enable a fair comparison with the statistics for 1890. The effect of this addition is to place Muskegon as the first city in rank for capital and value of production in 1880, but the fact should be noted that without this addition it stood second and Bay City occupied first place.

d But one establishment reported in 1880.

f All the establishments reported for North Muskegon have been organized since 1880.

e No lumber mills or saw mills reported in 1880.

g But two establishments reported in 1880.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in the preceding table. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 25.—MICHIGAN—QUANTITY AND VALUE OF FOREST PRODUCTS, BY PRINCIPAL LUMBER-PRODUCING POINTS.

CITIES.	Saw logs for domestic consumption. (Feet, sealed measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Value of all other forest products.	Total value of forest products which have not become the material for the mill product.
Adrian	10,000					\$383	\$563
Alpena	16,500,000						102,450
Bay City	24,012,000						293,839
Big Rapids	35,000		400	190	8	4,025	4,259
Cadillac	910,000					605	3,558
Flint	80,000	5	125	450		5	558
Grand Rapids.....	20,000,000						140,000
Greenville			25,000			15,750	17,500
Jackson	20,000	10	250	900		10	416
Ludington	57,020,000		2,400	13,000	450		430,750
Manistee	43,474,000					24,415	296,202
Manistique	45,682,000						233,000
Menominee	86,499,000				3,000		572,294
Midland.....	55,600	10	650	1,000	8	35	675
Muskegon	13,000,000						99,000
North Muskegon.....	125,000						2,000
Owosso.....	35,000		400	190	8	25	259
Saginaw.....	50,495,000		395	399	53	1,188	643,106

TABLE 26.—WISCONSIN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY COUNTIES. (a)

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Adams (b).....	1880	3	\$4,300	735,000				\$1,020		\$6,320	
	1890										
Ashland.....	1880	3	88,000	7,400,000	3,500,000			3,000		92,000	
	1890	18	3,776,707	202,458,000	28,084,000	133,000	7,000	90,747	\$249,267	2,593,539	\$2,719,734
Barron.....	1880	11	71,500	8,919,000	2,420,000					124,410	
	1890	29	2,686,688	76,862,000	79,148,000			108,666	401,860	1,449,731	1,488,355
Bayfield (b).....	1880										
	1890	7	3,927,085	153,418,000	39,711,000	5,000,000		32,823	484,106	2,142,944	2,144,644
Brown.....	1880	21	127,800	11,810,000	26,840,000	6,225,000	700,000	5,200		216,080	
	1890	16	815,384	39,447,000	26,563,000	4,033,000	382,000	41,322	170,484	759,465	773,290
Buffalo.....	1880	4	27,000	1,750,000	1,284,000			150		22,850	
	1890	3	18,365	2,006,000	390,000			3,000		26,855	26,855
Burnett.....	1880	3	8,500	850,000	500,000			1,000		9,400	
	1890	5	21,482	1,100,000	74,000			2,858		12,719	12,831
Calumet.....	1880	13	84,900	7,320,000	350,000	1,180,000	270,000	1,500		94,080	
	1890	8	38,269	1,255,000	74,000			2,898		22,054	22,166
Chippewa.....	1880	14	569,275	60,539,000	8,985,000	397,000	23,000	500		562,556	
	1890	27	2,989,063	81,139,000	24,389,000	13,000,000	900,000	162,559	697,218	1,999,061	2,002,290
Clark.....	1880	27	246,100	28,855,000	14,735,000	2,000,000				313,700	
	1890	37	649,028	31,494,000	13,363,000	3,180,000	1,587,000	43,158	104,039	599,639	614,111
Columbia (c).....	1880	3	9,000	850,000	500,000					12,425	
	1890										

a See Table 27 for details of quantity and value of forest products in 1890.

b The following-named counties are grouped because there were less than three reports from each of them; the number of establishments reporting is noted after each county for the respective years:

1880: Bayfield, 1; Dane, 1; Green Lake, 2; Iowa, 1; Lafayette, 1; Langlade, 2; Lincoln, 2; Price, 2.

1890: Adams, 1; Dane, 1; Green Lake, 1; Iowa, 1; Kenosha, 1; Ozaukee, 2; Racine, 1; Trempealeau, 1; Washburn, 2.

c No reports received.

TABLE 26.—WISCONSIN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION, ETC.—Continued.

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Crawford.....	1880	14	\$151,000	8,525,000	4,145,000	5,200,000	620,000	\$100	.....	\$153,975	.....
	1890	14	350,472	15,883,000	352,000	850,000	.....	3,732	\$188,759	418,544	\$462,516
Dodge.....	1880	8	39,200	2,757,000	.....	300,000	28,000	1,700	.....	37,263	.....
	1890	5	29,755	2,205,000	278,000	.....	.....	734	2,159	25,520	25,620
Door.....	1880	7	219,000	19,200,000	42,550,000	.....	.....	.....	.....	258,700	.....
	1890	19	1,037,673	36,500,000	74,578,000	133,000	7,000	12,394	296,494	837,806	853,304
Douglas.....	1880	3	54,000	5,700,000	4,250,000	.....	.....	.....	.....	79,000	.....
	1890	8	470,160	25,450,000	16,130,000	.....	.....	39,217	187,313	500,571	535,996
Dunn.....	1880	18	430,400	89,214,000	37,000,000	.....	.....	2,750	.....	802,550	.....
	1890	25	4,088,283	101,546,000	74,924,000	555,000	373,000	72,488	80,880	1,418,685	1,954,649
Eau Claire.....	1880	19	2,523,800	205,028,000	59,335,000	.....	.....	21,250	.....	2,337,387	.....
	1890	14	7,323,380	167,732,000	90,552,000	.....	.....	77,212	423,175	2,564,440	3,023,238
Fond du Lac.....	1880	11	430,400	42,900,000	8,350,000	.....	.....	25,037	.....	559,975	.....
	1890	5	427,073	11,952,000	790,000	.....	.....	744	.....	195,189	195,525
Forest (a).....	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	7	242,250	11,089,000	5,500,000	.....	.....	14,500	.....	173,810	173,810
Grant.....	1880	4	22,100	1,523,000	150,000	.....	.....	3,000	.....	18,150	.....
	1890	10	74,925	3,668,000	470,000	780,000	11,000	4,702	7,159	61,191	61,515
Green.....	1880	8	26,000	2,760,000	.....	50,000	20,000	500	.....	28,650	.....
	1890	5	30,114	485,000	74,000	150,000	.....	3,348	31,000	42,671	42,783
Jackson.....	1880	30	406,650	40,945,000	18,200,000	.....	.....	.....	.....	389,225	.....
	1890	13	2,160,924	73,974,000	30,943,000	.....	.....	10,942	70,065	886,799	910,147
Jefferson.....	1880	4	13,500	1,215,000	.....	.....	.....	.....	.....	14,250	.....
	1890	4	10,425	120,000	.....	.....	.....	1,200	.....	3,500	3,500
Juneau.....	1880	15	930,800	56,690,000	23,530,000	2,000,000	.....	1,541	.....	811,131	.....
	1890	11	1,425,534	36,335,000	17,704,000	.....	.....	25,994	192,150	722,345	722,807
Kewaunee.....	1880	16	72,000	7,200,000	36,775,000	.....	.....	849	.....	132,214	.....
	1890	17	91,975	4,788,000	6,280,000	.....	.....	4,096	4,855	57,822	58,046
La Crosse.....	1880	11	1,435,500	98,787,000	42,864,000	.....	.....	.....	.....	1,023,647	.....
	1890	16	6,512,387	216,236,000	124,076,000	133,000	7,000	67,286	655,763	3,349,936	3,717,822
Langlade (b).....	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	19	921,979	61,435,000	13,784,000	133,000	7,000	24,513	137,971	827,549	843,979
Lincoln (b).....	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	23	4,844,533	179,518,000	87,293,000	133,000	7,000	60,882	1,418,394	3,649,171	3,708,142
Manitowoc.....	1880	25	69,000	9,185,000	3,455,000	.....	.....	500	.....	106,510	.....
	1890	17	535,574	4,746,000	3,274,000	.....	.....	435,947	7,400	502,399	503,016
Marathon.....	1880	40	1,274,800	137,103,000	135,762,000	.....	.....	25,000	.....	1,499,178	.....
	1890	67	5,463,045	224,830,000	77,393,000	.....	180,000	214,450	628,285	3,539,454	3,592,444
Marinette.....	1880	9	4,460,000	174,443,000	25,355,000	.....	.....	.....	.....	1,678,734	.....
	1890	18	9,351,822	276,193,000	103,948,000	.....	400,000	187,587	103,411	3,349,414	3,479,209
Marquette.....	1880	3	6,500	750,000	.....	.....	.....	.....	.....	6,500	.....
	1890	3	3,750	164,000	.....	.....	.....	1,260	.....	3,340	3,340
Milwaukee (c).....	1880	3	12,000	1,360,000	.....	.....	.....	.....	.....	13,450	.....
	1890	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monroe.....	1880	11	169,500	15,800,000	1,000,000	2,300,000	85,000	2,080	.....	181,340	.....
	1890	14	232,337	14,330,000	500,000	.....	.....	30,113	22,697	183,345	183,781
Oconto.....	1880	18	1,469,950	86,378,000	77,960,000	.....	.....	6,000	.....	1,109,455	.....
	1890	17	3,293,884	68,794,000	44,902,000	.....	.....	31,716	612,159	1,573,724	1,594,752
Oneida (a).....	1880	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	1890	16	1,543,552	55,862,000	69,763,000	.....	.....	119,857	307,653	1,181,846	1,182,046

a The following-named counties have been formed since 1880, and therefore no reports are shown for that year: Florence county, formed in 1882 from Marinette and Oconto; Forest county, formed in 1885 from Langlade, Lincoln, and Oconto; Oneida county, formed in 1885 from Lincoln; Sawyer county, formed in 1883 from Ashland and Chippewa; Washburn county, formed in 1883 from Burnett. No reports for either census year were received from counties not mentioned in the table.

b See note b, page 26.

c No reports received.

TABLE 26.—WISCONSIN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION, ETC.—Continued.

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Outagamie.....	1880	15	\$222,500	17,250,000	2,300,000	18,500,000	2,150,000	\$3,200		\$312,008	
	1890	12	125,327	5,478,000	667,000			56,544	\$5,239	121,741	\$122,141
Ozaukee (a).....	1880	3	13,000	976,000		150,000	300,000			12,760	
	1890										
Pepin.....	1880	3	5,500	500,000	30,000	500,000	500,000			9,810	
	1890	3	24,320	2,725,000	278,000			134	2,159	29,510	29,610
Pierce.....	1880	28	178,400	15,008,000	450,000	618,000	192,000	1,000		181,510	
	1890	21	184,508	7,026,000	1,648,000	1,350,000	90,000	48,414	10,000	161,756	170,980
Polk.....	1880	15	134,350	16,798,000	24,370,000	3,000,000	300,000	300		219,680	
	1890	15	115,807	9,651,000	4,310,000		675,000	3,036	4,738	131,574	131,886
Portage.....	1880	31	586,040	71,505,000	27,460,000					706,875	
	1890	18	1,033,029	37,687,000	16,092,000			30,926	71,318	535,401	541,053
Price (a).....	1880										
	1890	6	1,881,728	60,505,000	41,282,000			28,130	266,159	1,118,848	1,119,798
Richland.....	1880	26	79,900	12,445,000	150,000	250,000	250,000	550		110,919	
	1890	34	150,094	5,146,000	74,000	500,000	100,000	14,840	6,396	94,348	98,513
Saint Croix.....	1880	20	372,566	24,050,000	20,746,000	3,900,000	235,000	1,950		349,743	
	1890	15	1,758,334	125,392,000	29,000,000	16,177,000	1,381,000	21,083	160,354	1,611,426	1,640,911
Sauk.....	1880	18	75,364	6,280,000	100,000	6,000,000	775,000	1,125		106,385	
	1890	19	99,778	3,042,000	222,000	684,000	92,000	22,241	1,200	66,616	67,652
Sawyer (b).....	1880										
	1890	8	2,231,470	37,700,000	19,085,000			525	322,365	826,998	826,998
Shawano.....	1880	15	75,800	7,135,000	4,720,000			100		84,195	
	1890	42	1,112,819	57,502,000	15,291,000	533,000	182,000	116,352	92,297	838,851	886,085
Sheboygan.....	1880	9	32,200	2,185,000				250		27,067	
	1890	8	40,014	1,195,000	74,000			2,393	41,775	59,954	60,066
Taylor.....	1880	6	132,000	15,750,000	26,001,000					217,700	
	1890	4	1,237,505	24,520,000	27,428,000				146,925	499,331	663,027
Vernon.....	1880	14	45,100	4,631,000	1,300,000	300,000		100		56,575	
	1890	26	124,069	4,570,000	671,000	1,030,000	195,000	22,952	6,200	101,777	104,125
Washington.....	1880	18	53,900	5,676,000		700,000	100,000	250		65,801	
	1890	12	55,714	1,818,000	74,000			4,954	3,500	29,315	29,507
Waukesha.....	1880	4	7,300	575,000						6,600	
	1890	6	16,156					3,372		3,372	3,372
Waupaca.....	1880	30	190,241	22,640,000	2,375,000	12,900,000	530,000	6,800		336,147	
	1890	28	505,171	27,697,000	5,896,000			28,671	33,459	370,634	392,087
Waushara.....	1880	7	30,000	3,485,000	55,000					40,355	
	1890	11	28,627	1,754,000	222,000			3,069	400	22,487	22,823
Winnebago.....	1880	28	1,172,500	78,925,000	123,074,000	5,000,000		27,019		1,224,214	
	1890	21	4,016,596	112,486,000	65,620,000	300,000	343,000	547,699	2,051,111	4,481,067	4,566,467
Wood.....	1880	23	788,923	67,764,000	21,300,000	10,980,000	300,000	4,500		805,195	
	1890	30	4,125,736	133,710,000	76,370,000	9,402,000	887,000	119,785	659,497	2,444,629	2,478,428
Other counties (a).....	1880	12	176,000	32,000,000	28,696,000	95,000	100,000	2,350		393,694	
	1890	11	829,344	18,872,000	5,765,000			20,946	67,906	311,727	316,975

a See note b, page 26.

b See note a, page 27.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in the preceding table. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 27.—WISCONSIN—QUANTITY AND VALUE OF FOREST PRODUCTS, BY COUNTIES.

COUNTIES.	Saw logs for domestic consumption. (Feet, scaled measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Round timber for export. (Feet, scaled measure.)	Value of all other forest products. (a)	Total value of forest products which have not become the material for the mill product.
Ashland.....	8,137,000	88	6,686	5,542	158		\$67,812	\$126,195
Barron.....	7,512,000	26	898	1,432	12		28	38,624
Bayfield.....				5,000				1,700
Brown.....	1,623,000	10	6,026	2,158	76		670	13,825
Burnett.....	5,000	5		258				112
Calumet.....	6,000		363					112
Chippewa.....	12,000	318	3,312	8,474	106	70,000	89	3,229
Clark.....	2,036,000	34	2,221	82,777	36		2,007	14,472
Crawford.....	4,106,000	9	406	7,887	103		7	43,972
Dodge.....		4	43	229			7	100
Door.....	1,222,000	400	24,600	15,084	152		590	15,498
Douglas.....	7,000,000		45,086	458			14	35,425
Dunn.....	77,061,000	15	1,089	9,374	5,340			535,964
Eau Claire.....	52,339,000			20,487	1,503		7	438,798
Fond du Lac.....	18,000		1,000	774				336
Grant.....		14	769	745			7	324
Green.....	22,000							112
Jackson.....	3,623,000	3,400	2,354	1,050			84	23,348
Juneau.....				1,258				462
Kewaunee.....	12,000		726	516				224
La Crosse.....	42,178,000		3,343	1,771	79		77	367,886
Langlade.....	1,795,000	27	7,818	4,545	161	320,000	161	16,430
Lincoln.....	8,322,000	100	7,600	3,354	232		310	58,971
Manitowoc.....			12,163	758				647
Marathon.....	7,530,000	53	2,116	11,593	21		149	61,990
Marinette.....	16,501,000	17	98,492	13,005	1,509		21	129,795
Monroe.....	10,000	19	1,132	1,003			7	436
Oconto.....	184,000	24	241,495	81,261			7	21,028
Oneida.....			86	458			14	200
Outagamie.....	50,000						7	400
Pepin.....	20,000						7	100
Pierce.....	1,512,000		726					9,224
Polk.....			449	716			14	312
Portage.....	1,106,000	13		916			14	5,652
Price.....				5,229			7	950
Richland.....	300,000		1,200	3,700				4,165
Saint Croix.....	666,000			21,228	1,753		13,884	29,485
Sauk.....	11,000		1,178	2,774				1,036
Shawano.....	7,271,000	425	15,615	19,732			7,390	47,234
Sheboygan.....	16,000							112
Taylor.....	21,796,000							163,696
Vernon.....	324,000	20	1,452	2,632				2,348
Washington.....	16,000		613					192
Waupaca.....	3,132,000	154	2,053	8,605			2,207	21,453
Waushara.....	18,000		1,000	774				336
Winnebago.....	7,500,000		7,974				7	85,400
Wood.....	3,611,000		3,300	3,295	2,618		4,270	33,799
Other counties.....	623,000	14	4,069	2,287	79		77	5,248

a Includes hewed timber shown in distinct classification in Table 12.

TABLE 28.—WISCONSIN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY SECTIONS. (a)

SECTIONS.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Lake Superior shore	1880	7	\$172,000	18,100,000	8,250,000			\$3,000		\$222,000	
	1890	33	8,173,952	381,326,000	83,934,000	5,133,000	7,000	162,787	\$920,691	5,237,064	\$5,400,374
Lake Michigan shore	1880	40	126,200	13,706,000	3,455,000	150,000	300,000	750		159,787	
	1890	29	616,092	8,468,000	3,700,000			452,312	51,334	604,677	605,648
Mississippi and Saint Croix rivers.	1880	116	2,380,016	172,374,000	95,839,000	13,518,000	1,867,000	7,600		2,045,349	
	1890	129	9,182,269	388,407,000	161,329,000	20,320,000	2,359,000	177,445	1,035,132	5,907,036	6,360,799
Green Bay shore	1880	86	6,571,250	316,281,000	211,780,000	24,725,000	2,850,000	15,249		3,707,191	
	1890	99	14,721,065	431,300,000	256,968,000	4,166,000	789,000	333,659	1,192,642	6,699,972	6,880,742
Interior counties	1880	455	10,574,593	1,021,560,000	543,598,000	44,152,000	2,481,000	125,572		11,818,020	
	1890	573	51,893,245	1,652,124,000	860,091,000	28,570,000	4,663,000	1,902,900	8,237,940	31,098,671	32,661,204

a See Table 29 for details of quantity and value of forest products in 1890.

NOTE.—In the preceding table the term "Lake Superior shore" embraces the counties of Douglas, Bayfield, and Ashland. The term "Lake Michigan shore" embraces the counties of Manitowoc, Sheboygan, Ozaukee, Milwaukee, Racine, and Kenosha. The term "Mississippi and Saint Croix rivers" embraces the counties of Burnett, Polk, Saint Croix, Pierce, Pepin, Buffalo, Trempealeau, La Crosse, Vernon, Crawford, and Grant. The term "Green Bay shore" embraces the counties of Marinette, Oconto, Outagamie, Brown, Kewaunee, and Door.

The interior counties are Washburn, Sawyer, Price, Oneida, Forest, Florence, Langlade, Lincoln, Taylor, Chippewa, Barron, Dunn, Eau Claire, Clark, Marathon, Shawano, Waupaca, Portage, Wood, Jackson, Monroe, Juneau, Adams, Marquette, Green, Green Lake, Fond du Lac, Washington, Dodge, Columbia, Sauk, Richland, Iowa, Dane, Jefferson, Waukesha, Lafayette, Rock, Walworth, Waushara, Winnebago, and Calumet.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in the preceding table. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 29.—WISCONSIN—QUANTITY AND VALUE OF FOREST PRODUCTS, BY SECTIONS.

SECTIONS.	Saw logs for domestic consumption. (Feet, scaled measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Round timber for export. (Feet, scaled measure.)	Value of all forest products. (a)	Total value of forest products which have not become the material for the mill product.
Lake Superior shore	15,137,000	16	51,772	11,000	164		\$67,826	\$163,320
Lake Michigan shore	18,000	19	12,932	1,503	3		7	971
Mississippi and Saint Croix rivers	48,810,000	88	7,957	33,747	1,947		13,996	453,763
Green Bay shore	19,592,000	465	371,382	112,253	1,743		1,295	180,770
Interior counties	205,669,000	4,601	65,410	194,636	10,081	390,000	16,828	1,562,533

a Includes hewed timber shown in distinct classification in Table 12.

The following table shows for each section its percentage for 1880 and 1890 of the total value of mill production and remanufactures in the state of Wisconsin, as reported for the respective years:

TABLE 30.—WISCONSIN—PERCENTAGE OF TOTAL VALUE OF MILL PRODUCTION AND REMANUFACTURES.

SECTIONS.	PER CENT.	
	1880.	1890.
Lake Superior shore	1.24	10.57
Lake Michigan shore	0.89	1.22
Mississippi and Saint Croix rivers	11.39	11.92
Green Bay shore	20.65	13.52
Interior counties	65.83	62.77

The percentage of gain in the value of mill products and remanufactures as reported for 1890 over the amount reported for 1880 is as follows:

	PER CENT.
Lake Superior shore.....	2,259.03
Lake Michigan shore.....	278.43
Mississippi and Saint Croix rivers.....	188.80
Green Bay shore.....	80.73
Interior counties.....	163.15

The following table, showing totals of capital invested and production at the principal productive points in the state of Wisconsin for the census years 1880 and 1890, includes all cities and towns for which special agents were appointed in 1890 and which contain three or more establishments reporting an aggregate value of production of \$20,000 or over:

TABLE 31.—WISCONSIN—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY PRINCIPAL LUMBER-PRODUCING POINTS. (a)

CITIES.	Year.	Number of establishments.	RANK ACCORDING TO—		Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
			Capital invested.	Value of products. (b)									
Ashland (c).....	1880												
	1890	7	10	6	\$1,790,900	131,500,000	6,500,000			\$4,650	\$30,000	\$1,501,705	\$1,514,205
Eagle River (d).....	1880												
	1890	4	14	14	266,480	8,175,000	56,278,000			11,334	107,159	322,760	322,760
Eau Claire.....	1880	8	2	1	1,909,000	173,578,000	39,037,000			19,750		1,976,595	
	1890	6	3	5	4,699,919	115,772,000	58,008,000			57,477	129,000	1,587,953	2,021,359
La Crosse.....	1880	6	4	4	1,324,700	84,767,000	34,864,000					880,107	
	1890	12	2	2	6,208,399	203,986,000	114,076,000	133,000	7,000	60,286	645,263	3,202,636	3,570,522
Marinette.....	1880	7	1	2	2,950,000	122,743,000	17,155,000					1,241,334	
	1890	8	1	4	7,109,128	191,318,000	67,058,000		400,000	139,412		2,430,891	2,495,616
Marshfield (c).....	1880												
	1890	6	13	12	589,359	28,150,000	9,000,000	3,000,000	400,000	5,800	80,750	450,200	450,200
Menomonie.....	1880	4	8	7	82,000	53,150,000	28,000,000					413,500	
	1890	4	4	8	3,667,075	63,249,000	62,122,000			25,577	13,000	833,315	1,365,023
Merrill (d).....	1880												
	1890	15	5	3	3,594,186	123,238,000	60,615,000			51,051	1,242,900	2,814,725	2,863,228
Oconto.....	1880	6	5	5	1,150,000	69,500,000	28,600,000			2,500		824,000	
	1890	6	7	9	2,581,580	54,425,000	21,278,000			16,634	537,159	1,283,160	1,291,260
Oshkosh.....	1880	22	3	3	1,342,000	66,575,000	118,164,000			27,019		1,052,914	
	1890	14	6	1	3,114,396	100,384,000	59,620,000		325,000	51,822	2,051,111	3,819,150	3,904,450
Rhineland (d).....	1880												
	1890	7	12	11	750,180	32,275,000	8,278,000			101,929	200,494	681,190	681,190
Stevens Point.....	1880	5	7	8	162,900	24,500,000	6,100,000					211,500	
	1890	10	11	13	851,780	28,426,000	14,068,000			28,003	71,318	441,851	442,151
Washburn (d).....	1880												
	1890	3	9	10	2,068,300	73,975,000	16,113,000	5,000,000		17,000	67,500	845,500	845,500
Wausau.....	1880	6	6	6	409,000	44,000,000	33,000,000			24,000		489,000	
	1890	13	8	7	2,294,433	89,545,000	24,352,000			151,182	217,159	1,421,559	1,421,771

a See Table 32 for a statement of the quantity and value of forest products in 1890.

b Rank for 1890 is given according to aggregate value of all products, including the value of forest products manufactured by milling establishments, but which have not become the material for the mill product. The inquiry of 1880 did not include this branch of the industry.

c But two establishments reported in Ashland in 1880, and but one establishment reported in Marshfield in 1880.

d No reports in 1880 for Eagle River, Merrill, Rhineland, and Washburn.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in the preceding table. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 32.—WISCONSIN—QUANTITY AND VALUE OF FOREST PRODUCTS, BY PRINCIPAL LUMBER-PRODUCING POINTS.

CITIES.	Saw logs for domestic consumption. (Feet, scaled measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Value of all other forest products.	Total value of forest products which have not become the material for the mill product.
Ashland.....	2,500,000						\$12,300
Eau Claire.....	52,283,000						433,406
La Crosse.....	42,178,000		3,343	1,771	79	\$77	367,886
Marinette.....	9,495,000						74,725
Menomonie.....	77,049,000	5	363	258			531,708
Merrill.....	7,100,000						48,503
Oconto.....		4	100,043	30,229		7	8,100
Oshkosh.....	7,500,000		5,000				85,300
Stevens Point.....	100,000						300
Wausau.....	6,000	9	406	487		7	212

TABLE 33.—MINNESOTA—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY COUNTIES. (a)

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Anoka (b).....	1880	5	\$429,000	32,372,000	8,097,000					\$431,500	
	1890										
Becker (b).....	1880										
	1890	6	69,615	3,194,000	433,000			\$830	\$2,159	35,565	\$41,424
Beltrami (c).....	1880										
	1890	4	51,063	2,710,000				1,248		27,268	27,268
Benton (b).....	1880										
	1890	4	242,835	7,800,000				150	18,500	127,870	127,870
Blue Earth.....	1880	14	33,450	4,925,000		700,000	10,000			61,875	
	1890	16	85,338	6,000,000	426,000			3,530	2,159	72,735	73,059
Carlton.....	1880	5	148,000	21,800,000	15,500,000					271,500	
	1890	11	2,829,055	86,798,000	42,978,000			10,734	750,815	1,816,592	1,867,442
Carver.....	1880	7	24,375	1,675,000				120		17,750	
	1890	7	34,485	2,565,000	278,000			2,779	2,159	32,665	32,765
Chisago.....	1880	8	64,500	5,620,000	500,000	1,900,000	8,000			68,950	
	1890	4	45,700	3,525,000	2,378,000			1,334	2,159	47,885	47,985
Crow Wing (b).....	1880										
	1890	11	747,802	36,920,000	7,557,000			17,246	137,000	614,560	614,560
Douglas.....	1880	3	7,000	1,940,000	25,000					19,500	
	1890	12	34,932	4,400,000	160,000			4,150		48,425	48,425
Fillmore.....	1880	4	6,700	1,350,000				80		13,680	
	1890	3	6,114	335,000	74,000			998		4,754	4,856
Goodhue.....	1880	4	158,000	8,275,000	4,075,000					105,225	
	1890	4	55,664	8,886,000	3,074,000			5,368	300	125,084	125,196
Hennepin.....	1880	18	2,445,000	223,581,000	59,660,000	490,000	81,000			2,762,348	
	1890	20	8,385,609	325,629,000	175,327,000	6,300,000		456,399	1,992,600	6,585,936	7,216,773
Houston (b).....	1880	3	11,600	2,360,000	1,000,000					29,400	
	1890										

^a See Table 34 for a statement of the quantity and value of forest products in 1890.

^b The following-named counties are grouped in order that the operations of individual establishments may not be disclosed to the public; the number of establishments in each county is here given for 1880 and 1890, respectively:

1880: Becker, 2; Benton, 2; Cass, 1; Crow Wing, 2; Dakota, 2; Dodge, 1; Kanabec, 1; Lake, 1; McLeod, 2; Mille Lacs, 1; Nicollet, 1; Polk, 2; Pope, 1; Ramsey, 1; Scott, 1; Wabasha, 2; Wadena, 2; Waseca, 2; Yellow Medicine, 1.

1890: Aitkin, 1; Anoka, 2; Brown, 1; Cass, 1; Dakota, 1; Houston, 1; Itasca, 1; Kanabec, 1; Kittson, 1; Nicollet, 1; Norman, 1; Sherburne, 2; Wabasha, 1; Waseca, 2.

^c No reports received for 1880.

LUMBER MILLS AND SAW MILLS.

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TABLE 33.—MINNESOTA—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION, ETC.—Continued.

COUNTIES.	Year.	Number of establishments.	Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Sets of headings. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
Hubbard (a)	1880										
	1890	3	\$18,905	1,020,000	250,000			\$660	\$1,900	\$12,340	\$12,340
Isanti	1880	3	10,500	1,900,000	10,000					20,500	
	1890	4	18,120	150,000	250,000			2,100	950	5,275	5,275
Le Sueur	1880	22	58,900	12,263,000	1,050,000					127,950	
	1890	23	109,868	7,219,000	150,000		450,000	10,609	2,950	100,653	100,653
McLeod (b)	1880										
	1890	3	11,150	106,000				5,450	1,250	7,800	7,800
Meeker	1880	6	12,800	2,372,000						25,800	
	1890	4	10,930	1,581,000				950		17,698	17,698
Mille Lacs (b)	1880										
	1890	4	366,550	15,500,000	2,500,000			96,400	7,000	293,900	301,000
Morrison	1880	10	57,300	6,093,000	542,000					70,565	
	1890	22	417,120	26,873,000	8,756,000			24,418	20,068	325,805	337,325
Otter Tail	1880	12	157,100	8,390,000	3,570,000					131,905	
	1890	21	60,424	3,605,000	1,400,000			30,321	1,275	66,666	71,577
Pine	1880	6	55,500	11,500,000	1,000,000			500		143,000	
	1890	7	986,193	54,900,000	14,500,000			16,250		627,950	627,950
Polk (b)	1880										
	1890	4	751,480	22,500,000	18,278,000			10,134	147,159	458,110	458,210
Rice	1880	9	27,000	3,054,000	185,000		365,000	1,500		43,690	
	1890	4	18,625	370,000				4,410		8,550	8,550
Saint Louis	1880	4	65,000	10,350,000						105,200	
	1890	11	1,707,820	56,582,000	11,278,000			60,434	212,365	916,249	966,163
Scott (b)	1880										
	1890	4	7,650	562,000				760		7,840	10,090
Sherburne (b)	1880	3	36,000	2,250,000	700,000	200,000	12,000			31,000	
	1890										
Sibley	1880	5	11,400	806,000						9,460	
	1890	6	17,120	65,000				10,950		11,600	11,600
Stearns	1880	14	48,850	8,660,000	2,567,000	4,070,000	50,000	600		123,200	
	1890	8	234,444	39,215,000	8,852,000			10,351	6,959	495,093	495,305
Todd	1880	9	23,575	2,685,000	1,300,000			100		31,275	
	1890	25	124,655	9,130,000	2,106,000			43,244	4,448	148,496	151,446
Wadena (b)	1880										
	1890	8	46,110	4,084,000	1,578,000			1,884	8,409	61,481	61,987
Washington	1880	9	1,505,000	111,500,000	43,129,000			15,000		1,533,780	
	1890	10	2,598,662	137,307,000	65,130,000			91,092	478,000	2,232,364	2,232,364
Winona	1880	3	1,003,500	43,075,000	29,401,000					750,800	
	1890	4	5,697,174	110,226,000	79,086,000			64,234	1,209,080	2,876,201	3,435,901
Wright	1880	20	45,245	5,708,000		65,000	15,000	2,600		66,946	
	1890	26	109,220	4,461,000	2,155,000			27,474	17,350	95,083	95,083
Other counties (b)	1880	28	325,850	29,470,000	22,255,000	400,000	6,000	600		369,239	
	1890	17	1,596,755	44,447,000	11,778,000			11,099	289,659	814,530	814,630

a The following-named counties have been formed since 1880, and therefore no reports are shown for that year: Hubbard county, formed in 1883 from Cass; Norman county, formed in 1881 from Polk. No reports for either census year were received from counties not mentioned in the table.

b See note b, page 32.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in the preceding table. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 34.—MINNESOTA—QUANTITY AND VALUE OF FOREST PRODUCTS, BY COUNTIES.

COUNTIES.	Saw logs for domestic consumption. (Feet, scaled measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Value of all other forest products.	Total value of forest products which have not become the material for the mill product.
Becker.....	784,000			11,731			\$5,859
Blue Earth.....	6,000	14	709	745		57	324
Carlton.....	9,000,000	554	3,043		213	127	50,850
Carver.....		4		229		27	100
Chisago.....					30	7	100
Fillmore.....		5	363	258			102
Hennepin.....	73,221,000	10,000	3,600,500	12,000	1,000		630,837
Mill Lake.....				11,000	5,300		7,160
Morrison.....		8	86	108,058	6	14	31,720
Otter Tail.....			5,000	11,000	410	240	4,911
Saint Louis.....	8,547,000					7	49,914
Scott.....	450,000						2,250
Stearns.....	5,000	9	406	487			212
Todd.....	500,000	8	86	1,458		14	2,950
Wadena.....	30,000			829		7	506
Winona.....	55,205,000						559,700
Other counties.....	20,000	29	724	1,403	3	8	312

The following table, showing totals of capital invested and production at principal productive points in the state of Minnesota for the census years 1880 and 1890, includes all cities and towns for which special agents were appointed in 1890 and which contain three or more establishments reporting an aggregate value of production of \$20,000 or over:

TABLE 35.—MINNESOTA—COMPARATIVE STATEMENT SHOWING TOTALS OF CAPITAL INVESTED AND VALUE OF PRODUCTION FOR THE CENSUS YEARS 1880 AND 1890, BY PRINCIPAL LUMBER-PRODUCING POINTS. (a)

CITIES.	Year.	Number of establishments.	RANK ACCORDING TO—		Capital.	Lumber. (Feet, board measure.)	Shingles. (Number.)	Staves. (Number.)	Value of all other mill products.	Value of remanufactures—1890.	Total value of mill products and remanufactures.	Aggregate of forest products, mill products, and remanufactures—1890.
			Capital invested.	Value of products. (b)								
Duluth.....	1880	4	3	3	\$65,000	10,350,000					\$105,200	
	1890	8	4	4	1,357,140	37,407,000	4,000,000		\$57,800	\$161,706	639,689	\$689,503
Minneapolis.....	1880	16	1	1	2,405,000	221,981,000	59,660,000				2,740,848	
	1890	17	1	1	8,382,304	325,629,000	175,327,000	6,300,000	454,919	1,992,600	6,584,456	7,215,293
Saint Cloud (c).....	1880											
	1890	4	5	5	208,780	37,625,000	8,778,000		8,659	2,159	468,585	468,685
Stillwater.....	1880	5	2	2	1,170,000	76,500,000	41,491,000				1,119,000	
	1890	5	3	3	1,389,162	80,177,000	41,150,000		12,842	209,000	1,096,424	1,096,424
Winona (d).....	1880											
	1890	4	2	2	5,697,174	110,226,000	79,086,000		64,234	1,209,080	2,876,201	3,435,901

a See Table 36 for a statement of the quantity and value of forest products in 1890.

b Rank for 1890 is given according to aggregate value of all products, including the value of forest products manufactured by milling establishments, but which have not become the material for the mill product. The inquiry of 1890 did not include this branch of the industry.

c But one establishment reported in Saint Cloud in 1880.

d But two establishments reported in Winona in 1880.

The following table shows, for the census year 1890, the quantity and value of those forest products manufactured by milling establishments engaged in logging which are not included as materials used in the manufacture of the mill products reported in the preceding table. No inquiry had been made in previous censuses respecting the operations of this branch of the industry.

TABLE 36.—MINNESOTA—QUANTITY AND VALUE OF FOREST PRODUCTS, BY PRINCIPAL LUMBER-PRODUCING POINTS.

CITIES.	Saw logs for domestic consumption. (Feet, scaled measure.)	Telegraph poles. (Number.)	Fence posts. (Number.)	Railway ties. (Number.)	Piling. (Number of pieces.)	Value of all other forest products.	Total value of forest products which have not become the material for the mill product.
Duluth	8,547,000						\$49,814
Minneapolis.....	73,221,000	10,000	3,600,500	12,000	1,000		630,837
Saint Cloud.....	4,000	43	229			\$7	100
Winona.....	55,205,000						559,700

MISCELLANEOUS DATA.—In the following tables, numbered 37 to 42, inclusive, miscellaneous data are presented respecting characteristics of plant, also certain items of expense which are incidental to the operations of the lumber-mill and saw-mill industry, although not usually taken into account as a charge on the cost of manufacture.

From the statistics respecting characteristics of plant it appears that the various kinds of mills for the manufacture of lumber are used in the following percentage of the whole number reported: Gang mills, 8.24 per cent; circular mills, 80.71 per cent; muley saws, 3.32 per cent; band mills, 7.73 per cent, the last named being of comparatively modern use for the purpose mentioned.

A comparison of the reports respecting steam power employed in 1890 with the reports for 1880 indicates that the average nominal horse power per engine in use in 1890 has increased 25.55 per cent. The average reported for this group of states in 1880 was 52.26 horse power per engine, while the average for 1890 is found to be 65.61 horse power. The average power used per establishment, as reported by the various classes of mills, will be found in Table 39.

TABLE 37.—SUMMARY OF REPORTS FOR LUMBER MILLS RESPECTING CHARACTERISTICS OF PLANT.

STATES.	Number of establishments reporting.	Number of gang mills.	AVERAGE NUMBER OF SAWS PER GANG.		Number of circular saw mills.	Number of muley saw mills.	Number of band saw mills.
			Slabbing gangs.	Wide gates.			
Total	2,472	261			2,557	105	245
Michigan.....	1,456	148	3	32	1,533	76	104
Wisconsin.....	731	72	3	31	727	29	118
Minnesota.....	285	41	4	36	297		23

Reports were received respecting the power employed by 2,141 establishments, and the following summary has been compiled from such reports:

TABLE 38.—POWER EMPLOYED.

ITEMS.	Total.	Michigan.	Wisconsin.	Minnesota.
Number of steam boilers.....	4,465	2,507	1,829	629
Number of steam engines.....	2,726	1,643	747	336
Estimated horse power of steam engines.....	178,843	94,628	55,622	28,593
Number of establishments using water power exclusively.....	295	138	137	20
Number of establishments using combined steam and water power.....	43	16	22	5

The average power employed by stove and heading mills is found to be 57 horse power. The average power employed by lumber mills and shingle mills of the respective classes is as follows:

TABLE 39.—AVERAGE POWER EMPLOYED PER ESTABLISHMENT.

LUMBER MILLS.	Horse power.	SHINGLE MILLS.	Horse power.
Class 1.....	494	Class 1.....	73
Class 2.....	56	Class 2.....	33
Class 3.....	30	Class 3.....	23

TABLE 40.—ANNUAL DEPRECIATION OF PLANT.

STATES.	Number of establishments reporting.	Capital invested in buildings and machinery.	Average annual allowance for depreciation.	Percentage of investment.
Total.....	900	\$12,427,961	\$1,107,128	8.91
Michigan.....	509	6,009,247	528,733	8.80
Wisconsin.....	282	4,844,679	444,342	9.17
Minnesota.....	109	1,574,035	134,033	8.52

a Average percentage for the group of states.

The average percentage obtained from a summary of the reports of 900 establishments, shown in the preceding table as 8.91, if applied to the total investment in buildings and machinery as reported by all and stated in Table 12, would produce an annual expense charge of \$3,041,911, equal to a charge of 32.3 cents per 1,000 feet on the total mill product.

Many manufacturers replied that they made no allowance for depreciation of plant, because the plant was constantly kept in its original state of efficiency, and as the cost of repairs was accounted for, it was therefore unnecessary to make additional allowance. The total amount reported in Table 12 for repairs to buildings and machinery is equivalent to 5.30 per cent of its value. The proposition is submitted that if this plant can be sold for the amount of its valuation, then no allowance for depreciation is necessary; but should there be a depreciation in the market value of the plant from its cost after making such repairs, then it is good accounting to make an annual allowance therefor.

TABLE 41.—EXTENT OF FOREST FIRES AND DAMAGE RESULTING TO STANDING TIMBER OWNED BY MILLING ESTABLISHMENTS DURING THE DECADE OF 1880 TO 1890.

STATES.	Number of reports.	Area of timbered land owned. (Acres.)	Estimated quantity of timber standing May 31, 1880. (Feet, board measure.)	Estimated area of timbered land burned over from June 1, 1880, to May 31, 1890. (Acres.)	Estimated quantity of timber killed. (Feet, board measure.)	Value as green timber.	Reduction in value of timber burned during the decade ended 1890.	Quantity of standing timber cut during year ended May 31, 1890. (Feet, scaled measure.)
Total.....	166	1,510,170	8,612,028,700	148,988	424,250,000	\$1,554,083	\$1,023,988	1,128,218,887
Michigan.....	118	521,767	3,782,528,300	69,867	229,080,000	863,528	641,355	651,116,352
Wisconsin.....	37	376,403	2,486,020,400	46,341	115,845,000	452,580	268,358	354,514,535
Minnesota.....	11	412,000	2,343,480,000	32,780	79,325,000	237,975	114,275	122,588,000

The form of the question respecting damage to standing timber by fire was as follows:

- (1) "What area of standing timber owned by you has been burned over since June 1, 1880?"
- (2) "Estimated quantity of timber killed by fire."
- (3) "Reduction in the value of timber by fire."

A circular letter was sent to each establishment from which a report had been received presenting the reply made, calling attention to the period of time embraced in the inquiry, and requesting such amendment to the reply as the facts might require upon reconsideration. From the correspondence and revision of original returns which resulted the data presented were obtained. The information received is believed to have peculiar value, because it is furnished by individual owners whose timbered land is usually well explored and the quantity of timber carefully estimated. The results obtained show a much lower rate of loss than has been generally indicated by current

forestry statistics. The total number of establishments reporting the ownership of timbered land is 883, of which only 166 reported any loss by fire.

It appears from the reports that greater care has been taken to prevent fires since the timber has become so valuable, and that the careless and wasteful methods which once prevailed in lumbering operations have given place to more sensible and conservative management. It is now the custom promptly to cut all timber of merchantable size which has been killed by fire and manufacture it before it has become damaged by worms, in which case the reduction in value from that of green timber does not exceed 50 per cent. The total average reduction of value to growing timber from fire, as obtained from the data presented in the preceding table, is found to be 65.89 per cent. From the loss for ten years is shown an average annual loss of \$102,399 to establishments which cut 1,128,218,887 feet during the census year, which is equivalent to an annual charge of 9.08 cents per 1,000 feet of product. The ratio of the area of timbered land burned to the whole area owned by the establishments reporting equals the ratio of 1 to 10.

TABLE 42.—STATISTICS OF LIVE STOCK IN USE AND ANNUAL COST FOR RENEWAL OF SAME.

STATES.	NUMBER OF ANIMALS IN USE.					AVERAGE COST OF SUBSISTENCE PER HEAD.			COST OF RENEWAL OF LIVE STOCK.		
	Number of reports.	Total.	Horses.	Mules.	Cattle.	Horses.	Mules.	Cattle.	Number of reports.	Number of animals reported in use.	Average annual cost of renewal of live stock.
Total.....	813	18,523	12,785	584	5,154				218	7,859	\$170,213
Michigan.....	484	7,026	5,877	203	946	\$112	\$119	\$82	119	2,913	84,536
Wisconsin.....	271	8,943	5,392	285	3,266	86	104	68	80	3,679	65,627
Minnesota.....	58	2,554	1,516	96	942	92	80	56	19	1,267	20,050

Reports were received showing the total amount expended for the subsistence of each kind of animals, and from these data the averages stated in the preceding table were obtained, but the data respecting the time for which the animals were subsisted are not complete. The term of employment is reported in Table 14 under the head of "Logging," and is found to average thirty-three weeks in Michigan, twenty-four weeks in Wisconsin, and twenty-two weeks in Minnesota. Upon this basis the average cost per week is found to be \$3.74 for horses, \$3.99 for mules, and \$2.60 for cattle.

The question as to annual allowance for renewal of live stock was intended to ascertain the cost for such renewal resulting from the loss of draught animals in service. This expense is shown by the reports of 218 establishments, employing 7,859 animals, to average \$21.66 per head employed. Taking the whole number of animals reported in Table 12 and applying the rate per head obtained, the sum of \$477,148 is produced, equivalent to an expense charge of 4.49 cents per 1,000 feet on the total forest and mill product reported. Aggregating the expense items obtained for depreciation of plant, damage to standing timber by fire, and annual cost for renewal of live stock, an annual expense charge of 45.84 cents per 1,000 feet is obtained.

To what extent this constitutes a fair charge upon the cost of manufacture can not be determined by this office, but the data elicited may prove of value to those interested.

TRANSPORTATION OF LOGS.

The amount expended for transportation of logs is stated in Table 12 as \$5,118,439. This amount represents only the expense incurred for this item by mill operators who cut standing timber and transport it to their mills for manufacture. Information was obtained, however, which enables the presentation of the following data, compiled from the reports of 584 establishments in Michigan, 270 establishments in Wisconsin, and 70 establishments in Minnesota, transporting an aggregate of 4,922,205,346 feet per annum:

TABLE 43.—TRANSPORTATION OF LOGS.

ITEMS.	MICHIGAN. (Total quantity reported, 2,523,901,206 feet.)		WISCONSIN. (Total quantity reported, 1,802,835,140 feet.)		MINNESOTA. (Total quantity reported, 595,469,000 feet.)	
	Per cent of the whole.	Average cost per 1,000 feet.	Per cent of the whole.	Average cost per 1,000 feet.	Per cent of the whole.	Average cost per 1,000 feet.
Transported by water exclusively.....	37.60	\$1.17	61.32	\$0.99	72.47	\$1.49
Transported by rail exclusively.....	12.26	1.17	9.94	1.13	4.12	0.45
Transported by teams exclusively.....	11.22	1.95	12.01	1.89	5.71	1.67
Combining the foregoing means of transportation...	38.92	1.94	16.73	1.61	17.70	2.59

It appears from the reports, showing a combination of several means of transportation, that in Michigan the combination of rail and water is required, while in Wisconsin and Minnesota the usual combination is of teams and water, thus indicating that the standing timber in Michigan is more remote from streams than in Wisconsin and Minnesota.

STATISTICS OF LOGGING RAILWAYS.

A special inquiry was made respecting the operations of logging railways, and complete reports were received for 43 railways, of which 31 are located in Michigan, 9 in Wisconsin, and 3 in Minnesota. The table following gives the data compiled from the complete reports, and includes only those roads using locomotives.

Incomplete reports were received for 73 roads in Michigan, 33 roads in Wisconsin, and 3 roads in Minnesota.

The total capital invested in logging railways by mill establishments located in the respective states has been stated in Table 12, and the capital so invested by logging operators will be found in Table 59.

TABLE 44.—OPERATIONS OF LOGGING RAILWAYS.

ITEMS.	Total.	Michigan.	Wisconsin.	Minnesota.
Miles of logging railway operated.....	407.5	279	99.5	29
Number of locomotives employed.....	76	51	19	6
Number of cars employed.....	1,336	911	330	95
Quantity transported (feet, scaled measure).....	884,492,700	615,683,652	229,262,048	39,547,000
Average value of road and equipment (per mile)....	\$1,794.36	\$4,283.62	\$5,430.85	\$7,524.14

From the reports embraced in the preceding table the various road gauges are found to be as follows:

166.75 miles of 3 feet 0 inches gauge.
13 miles of 3 feet 10 inches gauge.
9 miles of 4 feet 0 inches gauge.
7.50 miles of 4 feet 8 inches gauge.
211.25 miles of 4 feet 8.50 inches gauge.
407.50

It appears that an average of 3.28 cars are employed for each mile of road and that one locomotive is required for each 5.36 miles of road.

The range in cost of transportation per 1,000 feet by logging railway is from 21.75 cents to \$3, the average being \$1.07.

The average value per mile of road and equipment is shown to be \$4,794.36, the average number of hands employed per mile of road is 3.66, and the average annual wages per hand employed is \$353.91. The average annual expense for supplies, repairs, etc., per mile of road operated is \$479.72.

BOOM COMPANIES.

In connection with the subject of transportation of logs and timber an inquiry was addressed to all companies incorporated in the respective states for the special purpose of improving streams and water ways for the transportation of such material.

The following table gives the result of the inquiry :

TABLE 45.—INCORPORATED BOOM COMPANIES.

CLASSIFICATION.	AGGREGATE. (28 companies reported.)		MICHIGAN. (11 companies reported.)		WISCONSIN. (11 companies reported.)		MINNESOTA. (6 companies reported.)	
	Companies reporting respective items.	Amount.	Companies reporting respective items.	Amount.	Companies reporting respective items.	Amount.	Companies reporting respective items.	Amount.
CAPITAL STOCK :								
Amount of capital stock	28	\$2,761,825	11	\$483,000	11	\$1,858,150	6	\$420,675
Number of shares.....	26	31,703	10	7,020	11	21,176	5	3,507
Amount actually paid in.....	28	2,487,076	11	333,196	11	1,847,980	6	305,900
AGGREGATE ACTUAL CAPITAL INVESTED.....		3,560,492		360,172		2,629,963		561,357
PLANT :								
Timbered land	1	2,000	1	2,000				
All other land.....	15	708,266	6	18,991	6	643,275	3	46,000
Buildings.....	13	41,050	2	8,000	7	18,050	4	15,000
River improvements.....	25	2,367,691	9	121,178	10	1,866,813	6	379,700
All other items of investment in plant	16	168,068	7	125,877	5	22,691	4	20,000
Total		3,287,075		275,546		2,550,829		469,700
LIVE CAPITAL :								
Vessels used for transportation of lumber or logs, including steam tugs.....	9	117,372	3	40,900	4	21,472	2	55,000
Booms, chains, and supplies.....	13	72,801	3	26,776	5	30,969	5	15,056
Tools, implements, and live stock.....	13	65,293	2	12,000	6	25,193	5	28,100
All sundries not included in any of the foregoing items.....	7	17,951	2	13,950	1	1,500	4	2,501
Total		273,417		93,626		79,134		100,657
MISCELLANEOUS ITEMS.								
Total		283,114		166,814		103,168		13,132
Amount paid for land damages.....	9	27,449	3	2,449	4	21,750	2	3,250
Amount paid for other damages.....	3	6,950	1	450	2	6,500		
Amount paid for taxes	20	19,072	10	9,247	6	6,387	4	3,438
Amount paid for insurance.....	7	2,338	3	1,115	2	83	2	1,140
Amount paid for miscellaneous annual expenses not elsewhere reported.....	15	227,305	7	153,553	5	68,448	3	5,304

STATISTICS OF MANUFACTURES.

TABLE 45.—INCORPORATED BOOM COMPANIES—Continued.

LABOR AND WAGES.

EMPLOYÉS.	AGGREGATE. (28 companies reported.)			MICHIGAN. (11 companies reported.)			WISCONSIN. (11 companies reported.)			MINNESOTA. (6 companies reported.)		
	Companies reporting respective items.	Number of hands.	Wages paid.	Companies reporting respective items.	Average number of hands employed during year.	Total wages paid.	Companies reporting respective items.	Average number of hands employed during year.	Total wages paid.	Companies reporting respective items.	Average number of hands employed during year.	Total wages paid.
Total		641	\$189,400		225	\$82,120		346	\$76,900		70	\$30,380
RIVER IMPROVEMENTS AND REPAIRS:												
Officers and clerks.....	15	40	43,216	3	16	16,175	7	17	21,405	5	7	5,636
Engineers, blacksmiths, and other skilled workmen, overseers, and foremen or superintendents (not general superintendents or managers).	17	106	53,842	4	45	26,000	8	20	7,958	5	41	19,884
Laborers and other unskilled workmen.	13	495	92,342	3	164	39,945	8	309	47,537	2	22	4,860
Average number of weeks employed.	17	21.41		4	21.25		8	17.38		5	28.00	
ANIMALS EMPLOYED.		Number of animals.	Cost of sub-sistence.		Number of animals.	Cost of sub-sistence.		Number of animals.	Cost of sub-sistence.		Number of animals.	Cost of sub-sistence.
Total		46	\$3,025		12	\$311		32	\$2,624		2	\$90
Horses	5	38	2,493	2	10	270	2	26	2,124	1	2	90
Cattle	2	8	532	1	2	32	1	6	500			

MATERIALS USED, EXTENT OF OPERATIONS, AND AVERAGE TOLLS.

MATERIALS USED.	AGGREGATE. (28 companies reported.)		MICHIGAN. (11 companies reported.)		WISCONSIN. (11 companies reported.)		MINNESOTA. (6 companies reported.)	
	Companies reporting respective items.	Cost where used.	Companies reporting respective items.	Cost where used.	Companies reporting respective items.	Cost where used.	Companies reporting respective items.	Cost where used.
Total cost of all materials.....		\$17,213				\$3,263		\$13,950
Timber	3	8,450					3	8,450
All other materials.....	5	8,763			2	3,263	3	5,500
EXTENT OF OPERATIONS.		Amount.			Amount.	Amount.	Amount.	
Value of improvements and repairs made during year.....	22	\$133,180	7	\$15,482	10	\$71,698	5	\$46,000
Quantity of logs, timber, etc., handled and delivered during year (feet, scaled measure).	26	3,355,935,645	11	878,172,281	9	1,512,057,424	6	965,675,940
Average number of pieces to equal 1,000 feet	24	9.52	9	10.00	9	9.25	6	9.17
AVERAGE TOLLS.		Amount. (Cents.)			Amount. (Cents.)	Amount. (Cents.)	Amount. (Cents.)	
Aggregate average tolls per 1,000 feet.....		93.2		124.8		85.4		61.1
Average tolls per 1,000 feet charged for "running" logs and timber.	13	31.3	2	28.3	5	36.8	6	27.0
Average tolls per 1,000 feet charged for improvements.....	8	9.0	6	8.0	2	9.2		
Average tolls per 1,000 feet charged for storage, assorting, and delivery.	12	52.9	4	88.5	5	39.4	3	34.1

TABLE 45.—INCORPORATED BOOM COMPANIES—Continued.

TRANSPORTATION AND CARE OF LOGS.

ITEMS.	AGGREGATE. (28 companies reported.)		MICHIGAN. (11 companies reported.)		WISCONSIN. (11 companies reported.)		MINNESOTA. (6 companies reported.)	
	Companies reporting respective items.	Total.	Companies reporting respective items.	Total.	Companies reporting respective items.	Total.	Companies reporting respective items.	Total.
Average number of hands employed during the year.....	17	3,938	4	915	8	2,392	5	631
Amount paid for wages (including board).....	17	\$926,280	4	\$328,950	8	\$370,211	5	\$217,119
Average number of weeks employed.....	17	23.06	4	17.00	8	23.00	5	28.00
Average number of hours in ordinary day of labor:								
May to November.....	20	10.80	5	11.00	10	10.60	5	11.00
November to May.....	3	9.00			2	9.00	1	9.00

In explanation of the apparent discrepancy between the cost of transportation by water, as stated in Table 43, and the average charge for such service by boom companies in the respective states, as reported in the preceding table, it should be noted that there is a great difference in the extent of the service rendered. The expense of transportation reported by mill establishments often includes the cost of towing rafts of logs for long distances. In the returns embraced in the preceding table one company simply reports the ownership of a dam containing a log slide, for the use of which its charter permits a toll of two cents per 1,000 feet for "improvements." Another company reports a charge of seven cents per 1,000 feet for "improvements" and nothing for transportation or storage. One company reports a charge of only six cents per 1,000 feet for transportation, which is much below the average for such service. The reports cited cause an abnormal reduction in the average tolls.

The range of tolls for the respective classes of service is as follows:

Transportation per 1,000 feet.....	5 cents to 70 cents.
Improvements per 1,000 feet.....	2 cents to 50 cents.
Storage, assorting, and delivery per 1,000 feet.....	5 cents to \$1.

From the information furnished respecting the number of pieces required to equal 1,000 feet (scaled measure), it appears that the average log of Michigan, as handled by the companies reporting in that state, measures 100 feet; the average log of Wisconsin measures 108.1 feet; the average log of Minnesota measures 105 feet. The range is from 9 to 12 logs per 1,000 feet in Michigan, from 5.7 to 12.5 logs per 1,000 feet in Wisconsin, and from 5.5 to 14 logs per 1,000 feet in Minnesota.

TIMBERED LAND AND STANDING TIMBER.

The collection of accurate and comprehensive statistics relating to timbered land is found to be quite difficult. The census inquiry under the head of manufactures called for reports as to the area, quantity, and value of merchantable standing timber owned by all manufacturing establishments cutting such timber or consuming logs or bolts as raw material. For convenience of report and tabulation such establishments were divided into two classes, one of which embraced all those operating any kind of mill, and the other was intended to include all other productive industries engaged in cutting forest growth but not operating mills.

The schedules of questions addressed to each of these classes were entitled, respectively, "Special Schedule No. 5, Lumber mills and saw mills," and "Special Schedule No. 5a, Timber products." No attempt has been made to ascertain the total quantity of merchantable timber standing in any of the states. However desirable the information may be, it can be ascertained only approximately and by means of local experts employed as special agents for every county. Attempts have been made by several state governments to obtain it, but with unsatisfactory results. For this reason the inquiry made by this office has been limited to those lines upon which it was believed the most accurate information was accessible. The reports obtained from manufacturers respecting standing timber owned by them are believed to have peculiar value, because their timbered land is usually thoroughly explored and its product carefully estimated.

The question as to capital invested in timbered land and standing timber required for its answer a specific report of the amount invested in such lands as are not tributary to the mills operated by the establishments in question, also the amount invested in timbered land or standing timber which is tributary to such mills. The latter amount only is stated in Table 12, as forming a part of the operative capital.

The tables following show the total capital invested in all timbered lands in the United States by establishments located in the states of Michigan, Wisconsin, and Minnesota. Of this amount it is found that \$8,116,069 is invested in lands situated in other states and not reported as operative capital. It appears from the reports that the amount of such speculative investment in timbered lands by establishments located in the respective states is \$4,967,155 for Michigan, \$2,639,434 for Wisconsin, and \$509,480 for Minnesota. A statement showing the location of the land by states, the area and value of the several varieties of timber, etc., will be found in Tables 52 to 57, inclusive.

It should be understood that the items of capital invested, area of timbered land, and principal varieties of timber are statements of fact; the items of quantity of merchantable standing timber and its value are estimates.

In the explanatory note appended to the questions it was stated that "the average product per acre of merchantable timber should be given from the most reliable estimates, those upon which the owners base their value of the property." After tabulating the replies, the total estimated product and its value was obtained by computation in this office. To what extent the result approaches the total forest area or the total quantity of standing timber in the states of Michigan, Wisconsin, and Minnesota can not be determined, as complete data are not available.

This office has reason to believe that the amounts reported under the head of "Capital invested" are in some instances no criterion of the present value of the land, because it has been partly stripped of timber, and the investment does not appear to have been credited with the value of such timber. To what extent this affects the totals this office has no means of accurately determining, but simply publishes data derived from the reports as made.

The following table, showing the capital invested in timbered land, the area of the same, the estimated quantity of merchantable timber thereon, so far as reported to this office, and its estimated value, includes only timbered land or standing timber owned by manufacturing establishments operating mills located in the states named. A statement respecting the location of the land and the principal varieties of timber thereon will be found in Tables 52 to 57, inclusive. The term "merchantable timber" comprises timber which can be manufactured into lumber fit for market.

TABLE 46.—TIMBERED LAND OWNED BY ESTABLISHMENTS OPERATING MILLS.

LOCATION OF ESTABLISHMENTS.	Number of establishments reporting	Capital invested in timbered land.	Area in acres.	Estimated total product of merchantable timber. (Feet, board measure.)	Estimated value of standing timber.
Total	933	\$85,381,446	6,818,941	43,132,883,209	\$135,612,007
Michigan.....	550	45,586,478	3,592,511	25,678,433,269	72,681,666
Wisconsin.....	313	34,008,044	2,664,461	14,647,122,940	54,009,288
Minnesota	70	5,791,924	561,969	2,807,327,000	8,921,053

The following table includes only timbered land or standing timber owned by those manufacturing establishments located in the states named which are engaged in cutting such timber but are not engaged in mill operation. A statement respecting the location of the land and the principal varieties of timber thereon will be found in Tables 52 to 57, inclusive.

TABLE 47.—TIMBERED LAND OWNED BY ESTABLISHMENTS ENGAGED IN CUTTING.

LOCATION OF ESTABLISHMENTS.	Number of establishments reporting.	Capital invested in timbered land.	Area in acres.	Estimated total product of merchantable timber. (Feet, board measure.)	Estimated value of standing timber.
Total	253	\$22,792,991	2,651,159	14,283,210,980	\$50,107,358
Michigan.....	88	8,771,276	602,572	4,592,708,560	12,474,198
Wisconsin.....	129	8,260,215	1,039,707	7,739,462,480	30,724,815
Minnesota.....	36	5,761,500	388,880	1,951,040,000	6,908,845

The following table embraces reports from lumber manufacturers located at the points named respecting their ownership of timbered land in the states of Michigan, Wisconsin, and Minnesota. The great bulk of the material used by such manufacturers consists of timber cut in the states referred to and floated to the points named in the following list:

MISSISSIPPI RIVER POINTS.

McGregor, Iowa.
Dubuque, Iowa.
Lyons, Iowa.
Clinton, Iowa.
Davenport, Iowa.
Muscatine, Iowa.

MISSISSIPPI RIVER POINTS.

Burlington, Iowa.
Fort Madison, Iowa.
Keokuk, Iowa.
Quincy, Illinois.
Hannibal, Missouri.

LAKE PORTS.

Michigan City, Indiana.
Toledo, Ohio.
Sandusky, Ohio.
Cleveland, Ohio.
Tonawanda, New York.

A statement respecting the location of the land and the principal varieties of timber thereon will be found in Tables 52 to 57, inclusive.

TABLE 48.—REPORTS FROM LUMBER MANUFACTURERS RESPECTING OWNERSHIP OF TIMBERED LAND.

LOCATION OF LANDS.	Number of establishments reporting.	Capital invested in timbered land.	Area in acres.	Estimated total product of merchantable timber. (Feet, board measure.)	Estimated value of standing timber.
Total	11	\$3,754,853	245,540	1,936,140,000	\$8,435,260
Michigan.....	1	195,000	28,000	56,000,000	280,000
Wisconsin.....	10	3,559,853	203,040	1,785,040,000	7,854,360
Minnesota.....			14,500	95,100,000	300,900

The following table gives data as to ownership of timbered land by fifty establishments located in the states named, but not reported as lumber or saw mill establishments or manufacturers of timber products. They include reports from pulp mills, the mining industry, etc. A statement respecting the location of the land and the principal varieties of timber thereon will be found in Tables 52 to 57, inclusive.

TABLE 49.—DATA AS TO OWNERSHIP OF TIMBERED LAND BY FIFTY ESTABLISHMENTS.

LOCATION OF ESTABLISHMENTS.	Number of establishments reporting.	Capital invested in timbered land.	Area in acres.	Estimated total product of merchantable timber. (Feet, board measure.)	Estimated value of standing timber.
Total	50	\$16,600,981	1,754,949	11,434,658,780	\$28,347,926
Michigan.....	16	2,017,106	591,863	5,679,648,780	10,495,146
Wisconsin.....	8	869,275	340,916	1,298,920,000	4,065,980
Minnesota.....	26	13,714,600	822,170	4,456,090,000	13,786,800

The following table gives data as to ownership of timbered land by thirteen railway corporations located in the states named. A statement respecting the location of the land and the principal varieties of timber thereon will be found in Tables 52 to 57, inclusive.

TABLE 50.—DATA AS TO OWNERSHIP OF TIMBERED LAND BY THIRTEEN RAILWAY CORPORATIONS.

LOCATION OF PRINCIPAL OFFICE.	Number of companies reporting.	Area in acres.	Estimated total product of merchantable timber. (Feet, board measure.)	Estimated value of standing timber.
Total	13	5,519,910	37,358,332,750	\$24,920,577
Michigan.....	5	847,350	4,632,292,250	3,059,309
Wisconsin.....	3	1,209,121	1,553,367,500	1,749,490
Minnesota.....	5	3,463,439	31,172,673,000	20,111,778

The following table summarizes the data respecting timbered land given in the preceding tables:

TABLE 51.—RECAPITULATION.

NUMBER OF TABLE.	Total number of reports.	Total capital.	Total area. (Acres.)	Total product. (Feet, board measure.)	Total value.
Aggregate.....	1,262	\$128,530,271	16,390,499	108,145,225,719	\$247,423,128
Table 46—Domestic lumber and saw mill establishments....	933	85,381,446	6,818,941	43,132,883,209	135,612,007
Table 47—Logging establishments not operating mills.....	255	22,792,991	2,051,159	14,283,210,980	50,107,358
Table 48—Foreign lumber and saw mill establishments (b).....	11	3,754,853	245,540	1,936,140,000	8,435,260
Table 49—Miscellaneous reports.....	50	16,600,981	1,754,949	11,434,658,780	28,347,926
Table 50—Railway corporations.....	13	.....	5,519,910	37,358,332,750	24,920,577

a Capital invested by railway corporations not reported.

b Mill establishments located in Illinois, Indiana, Iowa, Missouri, New York, and Ohio.

The following table gives the total area of timbered land located in the states of Michigan, Wisconsin, and Minnesota embraced in Table 51. The principal varieties of timber, the proportionate area of each variety, the average growth of merchantable timber per acre, and the average value of each variety per 1,000 feet, together with the total product and total value of each variety, is given for each state and for the group of states.

TABLE 52.—TIMBERED LAND.

PRINCIPAL VARIETIES OF TIMBER.	SUMMARY.					MICHIGAN.				
	Area in acres.	Average product of merchantable timber per acre. (Feet, board measure.)	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet as standing timber.	Total value.	Area in acres.	Average product of merchantable timber per acre. (Feet, board measure.)	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet as standing timber.	Total value.
Total.....	12,469,391	55,088	63,450,260,719	\$53.43	\$217,625,210	4,040,343	55,975	24,140,699,199	\$53.44	\$83,131,280
White pine.....	8,342,695	5,670	47,304,557,519	4.05	191,530,084	2,547,055	6,053	15,418,280,499	4.67	72,049,723
White and Norway pine.....	1,309,420	2,785	3,646,233,000	2.83	10,332,929	55,510	7,889	437,900,000	3.52	1,543,250
Hemlock.....	345,144	4,715	1,627,208,000	1.02	1,658,030	218,486	4,745	1,036,792,000	1.05	1,091,407
Cedar.....	106,467	4,951	527,080,500	1.41	742,510	91,067	5,153	469,250,500	1.38	647,660
Miscellaneous soft woods.....	1,021,261	3,272	3,341,248,000	1.19	3,991,406	413,545	5,694	2,354,755,000	1.25	2,937,248
Oak.....	57,921	5,201	301,231,000	3.13	942,177	10,025	7,086	71,033,500	3.59	255,194
Beech, birch, and maple.....	91,539	6,035	552,462,900	1.79	989,309	81,299	6,123	497,812,900	1.80	897,329
Ash.....	1,238	8,397	10,395,000	3.18	33,020	1,238	8,397	10,395,000	3.18	33,020
Elm.....	37,246	2,202	82,018,000	1.54	126,465	35,199	1,907	67,123,000	1.18	78,875
Miscellaneous hard woods.....	1,156,460	5,238	6,057,826,800	1.20	7,279,280	586,919	6,436	3,777,356,800	0.95	3,597,574

PRINCIPAL VARIETIES OF TIMBER.	WISCONSIN.					MINNESOTA.				
	Area in acres.	Average product of merchantable timber per acre. (Feet, board measure.)	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet as standing timber.	Total value.	Area in acres.	Average product of merchantable timber per acre. (Feet, board measure.)	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet as standing timber.	Total value.
Total.....	5,407,934	54,911	26,560,035,520	\$53.69	\$97,885,891	3,021,114	54,220	12,749,526,000	\$52.87	\$36,608,039
White pine.....	4,021,815	5,398	21,708,869,020	4.00	86,844,723	1,773,825	5,738	10,177,408,000	3.21	32,635,638
White and Norway pine.....	172,493	10,092	1,740,831,000	3.49	6,075,773	1,061,417	61,357	1,467,502,000	1.85	2,713,906
Hemlock.....	126,658	4,661	590,416,000	0.96	566,623	.....	.....	.....	.....	.....
Cedar.....	14,100	3,825	53,930,000	1.64	88,550	1,300	3,000	3,900,000	1.62	6,300
Miscellaneous soft woods.....	607,476	5,620	984,253,000	1.07	1,051,678	240	9,323	2,240,000	1.11	2,480
Oak.....	20,195	4,756	96,042,500	2.96	284,035	27,701	4,843	134,155,000	3.00	402,948
Beech, birch, and maple.....	9,960	5,409	53,870,000	1.69	90,930	280	2,756	780,000	1.36	1,060
Ash.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Elm.....	1,680	5,762	9,680,000	3.34	32,360	367	5,210	5,215,000	2.92	15,230
Miscellaneous hard woods.....	433,557	3,050	1,322,144,000	2.16	2,851,229	135,984	7,047	958,326,000	0.87	830,477

a General average.

b This item includes 1,012,800 acres of railway lands, which average but 1,154 feet per acre; the remaining 68,617 acres average 4,347 feet per acre.

c This item includes 568,628 acres of railway lands, which average but 1,000 feet per acre.

d Includes one report of 160 acres, containing elm and basswood, averaging 30,000 feet per acre.

The range of value per 1,000 feet for standing timber of each variety, as reported in the preceding table, is as follows:

TABLE 53.—VALUE OF STUMPAGE.

TIMBER.	MICHIGAN.		WISCONSIN.		MINNESOTA.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Pine	\$8.50	\$0.90	\$6.00	\$1.00	\$7.00	\$1.50
Hemlock	2.00	0.20	2.00	0.50		
Cedar	5.00	0.25	4.00	0.50	2.00	2.00
Oak	8.00	0.50	6.00	2.00	5.00	2.50
Ash	3.50	1.00				
Elm	7.00	1.00	4.00	1.50	3.00	2.00
Beech, birch, and maple	8.00	0.50				
Birch and maple					2.00	1.00
Miscellaneous hard woods	2.00	0.50	6.00	0.50	3.00	0.80

The description of timbered land and standing timber owned by manufacturing establishments and railway corporations located in the states of Michigan, Wisconsin, and Minnesota, as reported in Tables 46, 47, 49, and 50, is continued in the following tables, the states in which the land is located being grouped according to the principal varieties of merchantable timber produced in the respective groups.

The principal varieties of merchantable timber included in the following table are fir and cedar. The entire ownership is reported by railway corporations located in the state of Minnesota.

TABLE 54.—FIR AND CEDAR.

STATES.	Area in acres.	Average product of merchantable timber per acre.	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet.	Estimated value of standing timber.
Total	1,100,000	4,545	5,000,000,000	\$1.00	\$5,000,000
Montana	800,000	4,000	3,200,000,000	1.00	3,200,000
Idaho	300,000	6,000	1,800,000,000	1.00	1,800,000

The principal varieties of merchantable timber included in the following table are Douglas fir and redwood. The percentage of the whole area embraced in the table as owned by establishments located in Michigan, Wisconsin, and Minnesota is as follows:

	PER CENT.
Michigan	5.80
Wisconsin	0.10
Minnesota	94.10
	100.00

TABLE 55.—DOUGLAS FIR AND REDWOOD.

STATES.	Area in acres.	Average product of merchantable timber per acre.	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet.	Estimated value of standing timber.
Total	1,275,330	21,509	27,431,460,000	\$0.52	\$14,268,157
California	27,360	44,532	1,218,400,000	0.82	1,001,600
Oregon	23,708	42,322	1,003,360,000	0.30	304,190
Washington	1,224,262	20,592	25,209,700,000	0.51	12,962,367

The principal varieties of merchantable timber included in the following table are yellow pine and cypress. The percentage of the whole area embraced in the table as owned by establishments located in Michigan and Wisconsin is as follows:

	PER CENT.
Michigan	97.30
Wisconsin.....	2.70
	100.00

TABLE 56.—YELLOW PINE AND CYPRESS.

STATES.	Area in acres.	Average product of merchantable timber per acre.	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet.	Estimated value of standing timber.
Total	1,407,358	7,918	11,143,725,060	\$0.78	\$8,723,361
Virginia.....	21,000	6,000	126,000,000	2.00	252,000
North Carolina.....	111,418	8,560	953,770,000	0.36	346,885
Georgia.....	14,300	4,375	62,950,000	0.79	49,475
Florida	67,016	5,991	401,490,000	1.10	439,845
Alabama.....	76,651	7,228	554,065,000	0.87	483,038
Mississippi	531,498	7,106	3,776,644,000	0.52	1,564,723
Louisiana.....	341,083	9,883	3,370,954,000	0.74	2,501,049
Arkansas.....	240,562	7,782	1,871,932,000	1.41	2,646,446
Missouri.....	3,740	6,925	25,900,000	1.93	49,900

The principal varieties of merchantable timber included in the following table are yellow poplar and hard woods. The entire ownership is reported by establishments located in the state of Michigan.

TABLE 57.—YELLOW POPLAR AND HARD WOODS.

STATES.	Area in acres.	Average product of merchantable timber per acre.	Estimated total product of merchantable timber. (Feet, board measure.)	Average value per 1,000 feet.	Estimated value of standing timber.
Total	138,420	8,030	1,119,780,000	\$1.61	\$1,866,400
West Virginia.....	45,500	6,429	292,500,000	4.21	1,230,000
Kentucky	12,000	6,000	72,000,000	2.00	144,000
Tennessee.....	74,600	9,856	736,000,000	0.55	408,000
Ohio.....	6,000	3,000	18,000,000	1.00	18,000
Illinois.....	320	4,000	1,280,000	5.00	6,400

The consumption in Michigan, Wisconsin, and Minnesota of merchantable standing timber of all varieties by the manufacturing industries operating mills, whose reports are presented herewith, is shown in Table 12 to have aggregated 9,845,113,654 feet (scaled measure) during the census year, to which should be added the timber cut and manufactured by establishments having mills located in other states. From reports embracing the operations at such places, it appears that about 750,000,000 feet is manufactured at points on the Mississippi river and 75,000,000 feet at points on Lake Erie. These quantities, added to the domestic consumption, aggregate 10,670,000,000 feet of standing timber consumed annually for raw material.

It also appears from the reports of the mill establishments referred to that the quantity of standing timber now owned by them is only sufficient at this rate of consumption to supply their requirements for four or five years. The question as to the total supply of timber remaining other than that reported is therefore of the highest importance.

From the data supplied in the preceding tables respecting average quantities of the principal varieties per acre, it is believed that a close approximate might be made to the total quantity of merchantable timber now standing in the group of states forming the subject of this report provided the area of timbered land held by the federal and state governments could be obtained.

Inquiry has been made to ascertain the area of public land containing merchantable timber held by the federal

government and by the state governments of Michigan, Wisconsin, and Minnesota. The result of the inquiry respecting federal ownership is contained in the following letter:

DEPARTMENT OF THE INTERIOR,
GENERAL LAND OFFICE,
WASHINGTON, D. C., January 31, 1891.

SIR: I am in receipt, by your reference for report, of a communication from the Superintendent of Census, dated the 24th instant, requesting that a statement be furnished him showing the area in acres of timbered lands now owned by the general government in the states of Michigan, Wisconsin, and Minnesota.

In reply, I have the honor to state that in the Annual Report of this office for 1890, upon pages 108, 109, and 120, it is shown that in the state of Michigan there are 832,707 acres of vacant public land, in the state of Minnesota 6,913,544 acres surveyed and 4,011,520 acres unsurveyed, and in the state of Wisconsin 819,320 acres.

It is believed that the areas containing timber lands are mainly in the northern portion of each state, but it will be impracticable for this office to furnish the desired information in detail.

Very respectfully,

LEWIS A. GROFF, *Commissioner*.

The Honorable THE SECRETARY OF THE INTERIOR.

The report referred to in the preceding letter indicates the area of unsurveyed land in the state of Minnesota to be located as follows:

	ACRES.
Beltrami county	207,360
Cook county.....	138,240
Itasca county.....	1,566,720
Kittson county	506,880
Lake county.....	668,160
Marshall county	69,120
Polk county	2,560
Saint Louis county.....	852,480
Total.....	4,011,520

All the counties named are located in the northern part of the state, and the maps published with volume IX, Reports of the Tenth Census, indicate most of the area to be timbered, principally with pine.

From a report made by Hon. W. W. Braden, state auditor, it is stated that the total forest area owned by the state of Minnesota is estimated to be 13,000,000 acres, of which 8,000,000 acres are heavily timbered, and the remaining 5,000,000 acres are sparsely timbered, or have been cut over. The proportionate area of the heavily timbered land, containing white and Norway pine, is estimated to be 4,000,000 acres, containing 20,000,000,000 feet (board measure), valued as standing timber at \$60,000,000.

The area of public land held by the state of Michigan June 30, 1888, as stated in the official report of the commissioner of the state land office, was 584,833 acres, of which 538,685 acres were for sale at that date. This office has been unable to ascertain what proportion of this land contains merchantable timber, but its average market value is shown to be \$1.75 per acre.

The total area of land held by the state of Wisconsin September 30, 1890, as reported by a special agent of this office at Madison, Wisconsin, was 671,633 acres. Most of this land is located in the northern counties, and about one-half of it is said to be timbered.

White pine (*P. strobus*) constitutes the most valuable timber growth of the northwest, and no considerable area of this species exists in the United States outside the states of Michigan, Wisconsin, and Minnesota. It is therefore of interest to know the annual consumption of this particular variety.

Annual statistics of the total white-pine lumber product of the northwest from 1873 to 1890, inclusive, have been compiled and published in The Northwestern Lumberman of Chicago, and form the only data available in this connection. The following table gives the totals for each year, as published in that journal:

TABLE 58.—STATEMENT OF THE ANNUAL PRODUCT OF WHITE-PINE LUMBER IN THE NORTHWEST FROM 1873 TO 1890, INCLUSIVE.

WHITE-PINE LUMBER.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.
Sawed lumber (feet, board measure).	3,963,780,000	3,751,306,000	3,968,553,000	3,879,046,000	3,565,333,496	3,629,472,759	4,806,943,000	5,651,295,006	6,768,856,749
Shingles (number).....	2,277,434,000	2,473,217,000	2,515,838,000	2,900,531,000	2,696,857,000	2,561,491,000	2,859,113,000	2,972,912,000	3,546,007,000
	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
Sawed lumber (feet, board measure).	7,552,150,744	7,624,789,786	7,935,033,054	7,053,094,555	7,425,368,443	7,757,916,784	8,388,716,460	8,305,833,277	8,664,504,715
Shingles (number).....	4,094,278,000	3,964,757,000	4,559,826,000	4,257,974,000	4,577,531,000	4,116,467,000	4,514,647,000	4,698,976,000	4,487,824,000

The following statement places the results contained in the preceding tables in comparison with the estimates of the total quantity of merchantable white pine standing in 1880 in the states of Michigan, Wisconsin, and Minnesota, as published in the reports of the Tenth Census. The quantity of lumber and shingles manufactured is obtained by computing 5,000 shingles as equal to 1,000 feet (board measure) and aggregating the quantities reported in Table 56.

	FEET.
Total quantity of pine lumber and shingles manufactured since 1880, as reported to The Northwestern Lumberman..	86,039,917,567
Quantity of white pine reported by individual owners as standing May 31, 1890.....	47,304,557,519
Total.....	133,344,475,086
Deduct estimated total quantity standing in 1880.....	84,170,000,000
Partial gain over estimate of 1880.....	49,174,475,086

The data for the estimates for 1880 were collected and compiled by gentlemen of acknowledged experience with the subject, and the preceding statement is submitted as good evidence of the difficulties attending the collection of reliable information respecting standing timber. The sources from which the information presented in this report was derived have been described. It is evident therefrom that the supply of merchantable white pine is rapidly nearing exhaustion. It is shown from the individual returns that the average annual consumption of this variety of timber as material for manufacturing industry in the three states under consideration is over ten billion feet (board measure), and that manufacturers' holdings of such timber are only sufficient to supply them for about five years at the present rate of cutting. The quantity in reserve is believed to be principally that standing on lands owned by the federal and state governments.

This quantity is an unknown factor, but all the data respecting it which this office has been able to collect are presented herewith.

TIMBER PRODUCTS.

Reference has previously been made to the schedule of inquiry issued by this office, entitled "Special Schedule No. 5a, Timber products." The following compilation of reports received on this schedule does not fully represent the extent and value of the industry which the inquiry was intended to embrace. The instructions respecting this inquiry issued to enumerators and special agents of this office directed that it "should be presented to all operators engaged in productive industry in forest growth which does not come within the scope of the schedule for agriculture and whose operations are not connected with lumber mills or saw mills."

Had the instructions been strictly complied with, the data obtained would have enabled a full presentation of statistics respecting the forest crop of the country, estimated by Professor Sargent in his report for 1880 to exceed \$700,000,000 in annual value. Among the important items for which the reports are incomplete may be mentioned wood used as fuel and for the manufacture of charcoal, material for wood pulp and for distilled products, uncultivated vegetable substances used in the manufacture of medicines, uncultivated nuts, wood used for fencing, and timber cut for railway ties. Statistics of the quantity and value of saw logs probably approximate most nearly to correct totals of any item in the classification.

From the published reports of the Paper Manufacturers' Association it appears that the pulp mills located in Michigan, Wisconsin, and Minnesota, if operated to their full capacity, would require 115,000 cords of wood annually.

No reports whatever were obtained from some counties having an extensive forest area. It was impracticable to examine and verify the returns obtained by enumerators during the brief period they were in the field, and equally so to obtain additional returns by means of correspondence since the conclusion of their work. Blanks will be forwarded to all persons engaged in the industry who may request them for the purpose of making a return, and such returns will be included in the county totals when revised for the final report. Such correspondence is invited by this office, and will receive prompt attention.

The following table shows the totals for each branch of the industry:

TABLE 59.—TIMBER PRODUCTS.
CAPITAL INVESTED AND ANNUAL EXPENSE CHARGES.

CAPITAL INVESTED.	AGGREGATE. (574 establishments reported.)		MICHIGAN. (190 establishments reported.)		WISCONSIN. (312 establishments reported.)		MINNESOTA. (72 establishments reported.)	
	Establishments reporting respective items.	Amount.	Establishments reporting respective items.	Amount.	Establishments reporting respective items.	Amount.	Establishments reporting respective items.	Amount.
AGGREGATE CAPITAL INVESTED.....		\$16,765,405		\$15,369,721		\$20,299,071		\$11,096,613
Timbered land or standing timber.....	284	24,031,374	96	7,278,216	148	8,371,333	40	8,381,805
PLANT:								
Tools, implements, and live stock	492	1,723,649	159	383,206	271	892,333	62	448,110
Logging railways and equipment	27	666,309	13	180,978	12	359,831	2	125,500
Canals and flumes or chutes.....	6	22,445	1	200	5	22,245		
River improvements.....	47	214,570	8	31,135	21	98,435	18	85,000
Vessels.....	18	522,292	9	492,678	6	26,114	3	3,500
All other items of investment in plant.....	183	999,389	95	749,672	77	101,017	11	148,700
Total		4,148,654		1,837,869		1,499,975		810,810
LIVE ASSETS:								
Value of product on hand	234	11,610,258	140	3,330,189	73	7,565,260	21	714,809
All other capital not included in the foregoing items	278	6,975,119	100	2,923,447	138	2,862,483	40	1,189,189
Total		18,585,377		6,253,636		10,427,743		1,903,998
ANNUAL EXPENSE CHARGES—Total.....		3,700,020		1,567,386		1,652,749		479,885
Amount paid for rent (not including cost of stumpage).....	33	59,744	12	2,766	12	52,177	9	4,801
Amount paid for taxes	377	283,983	131	88,534	198	153,816	48	41,633
Amount paid for insurance	99	73,287	44	49,544	48	20,018	7	3,725
Amount paid for ordinary repairs	178	72,323	78	16,565	86	40,845	14	14,913
Amount paid for commissions and other expenses of selling.....	38	58,473	18	35,652	18	22,132	2	2,689
Amount paid for interest on cash used in the business	161	303,715	51	143,337	75	118,050	35	42,319
Amount paid for all sundries not reported elsewhere (a).....	219	2,848,465	100	1,232,988	100	1,245,702	19	369,805

a The amount reported for "Value of all other products," on page 52, consists principally of the value of lumber manufactured at custom mills for the owners of the material.

STATISTICS OF MANUFACTURES.

TABLE 59.—TIMBER PRODUCTS—Continued.

LABOR AND WAGES.

EMPLOYÉS.	AGGREGATE. (574 establishments reported.)			MICHIGAN. (190 establishments reported.)			WISCONSIN. (312 establishments reported.)			MINNESOTA. (72 establishments reported.)		
	Establishments reporting respective items.	Average number of hands employed during year.	Wages paid.	Establishments reporting respective items.	Average number of hands employed during year.	Wages paid.	Establishments reporting respective items.	Average number of hands employed during year.	Wages paid.	Establishments reporting respective items.	Average number of hands employed during year.	Wages paid.
Aggregate.....		22,087	\$4,958,378		6,982	\$1,974,838		9,677	\$1,807,327		5,428	\$1,176,213
Officers and firm members.....	315	455	270,826	78	115	89,722	199	243	113,813	38	97	67,291
Foremen and mechanics.....	331	1,469	534,937	76	280	150,643	199	824	256,708	56	365	127,586
Hewers.....	55	710	199,272	11	298	107,486	6	55	5,279	28	357	86,507
Choppers and sawyers.....	331	5,545	1,092,213	69	1,518	389,477	201	2,367	383,211	61	1,660	319,525
Skidders and swampers.....	279	3,895	764,691	37	1,008	282,060	167	2,238	345,130	55	649	137,501
Teamsters.....	317	3,633	755,551	78	910	262,682	178	1,614	285,551	61	1,109	207,318
Cooks and other employes:												
Males above 16 years.....	355	4,936	1,129,058	112	1,832	534,516	184	1,973	376,847	59	1,131	217,695
Females above 15 years.....	59	92		19	28		40	64				
Children.....	3	4		2	3		1	1				
Total.....		20,739	4,746,548		5,992	1,816,586		9,379	1,766,539		5,368	1,163,423
Piecework (not included in the foregoing statement):												
Males above 16 years.....	67	1,335	211,830	46	977	158,252	18	298	40,788	3	60	12,790
Females above 15 years.....	3	7		3	7							
Children.....	1	6		1	6							
Total.....		1,348	211,830		990	158,252		298	40,788		60	12,790

ANIMALS IN USE.

ANIMALS IN USE.		Number of animals.	Cost of sub-sistence.		Number of animals.	Cost of sub-sistence.		Number of animals.	Cost of sub-sistence.		Number of animals.	Cost of sub-sistence.
Total.....		10,462	\$667,444		1,856	\$187,423		5,265	\$326,429		3,341	\$153,592
Horses.....	370	6,731	494,649	91	1,595	168,051	218	3,181	229,306	61	1,955	97,292
Mules.....	13	67	6,113	3	18	2,382	7	43	3,099	3	6	632
Cattle.....	244	3,664	166,682	46	243	16,990	146	2,041	94,024	52	1,380	55,668

TIMBER PRODUCTS.

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TABLE 59.—TIMBER PRODUCTS—Continued.

MATERIALS USED.

STATES.	HARD WOODS.				SOFT WOODS.			
	Establishments reporting respective items.	Cords.	Number. (Feet, scaled measure.)	Value of stumpage.	Establishments reporting respective items.	Cords.	Number. (Feet, scaled measure.)	Value of stumpage.
Total.....	71	23,252	109,552,000	\$529,186	360	14,379	1,787,065,000	\$7,041,191
Michigan.....	32	13,533	97,156,000	484,505	84	12,258	571,949,000	2,560,275
Wisconsin.....	36	9,254	4,746,000	23,161	229	2,121	848,855,000	3,099,923
Minnesota.....	3	465	7,650,000	21,520	47	.....	366,261,000	1,380,993

STATES.	MISCELLANEOUS WOODS.				ALL OTHER MATERIALS USED.		Total cost of materials used.
	Establishments reporting respective items.	Cords.	Number. (Feet, scaled measure.)	Value of stumpage.	Establishments reporting respective items.	Cost, exclusive of those included as wages paid or keep of cattle.	
Total.....	77	240,462	33,200,000	\$153,958	196	\$366,832	\$8,091,167
Michigan.....	70	227,237	16,235,000	107,940	72	124,880	3,277,600
Wisconsin.....	7	13,225	16,965,000	46,018	75	165,622	3,334,724
Minnesota.....	.....	.....	.....	.....	49	76,330	1,478,843

SUMMARY OF MATERIALS USED.

ITEMS.	AGGREGATE. (574 establishments reported.)		MICHIGAN. (190 establishments reported.)		WISCONSIN. (312 establishments reported.)		MINNESOTA. (72 establishments reported.)	
	Establishments reporting respective items.	Amount.	Establishments reporting respective items.	Amount.	Establishments reporting respective items.	Amount.	Establishments reporting respective items.	Amount.
Aggregate quantity of timber of all varieties (cubic feet)	473	236,618,508	176	103,777,167	249	93,832,758	48	39,008,583
Total value of stumpage.....	.....	\$7,724,335	.....	\$3,152,720	.....	\$3,169,102	.....	\$1,402,513
Cost of all other materials	196	366,832	72	124,880	75	165,622	49	76,330
Total cost of all materials.....	.....	8,091,167	.....	3,277,600	.....	3,334,724	.....	1,478,843

STATISTICS OF MANUFACTURES.

TABLE 59.—TIMBER PRODUCTS—Continued.

MANUFACTURED PRODUCTS.

CLASSES.	AGGREGATE.			MICHIGAN.		
	Establishments reporting respective items.	Quantity.	Value.	Establishments reporting respective items.	Quantity.	Value.
Total			\$20,807,446			\$8,207,380
Charcoal (bushels)	69	9,937,704	689,066	65	9,473,704	646,871
Cooperage stock (cords)	9	7,883	29,252	2	318	535
Fence posts (number)	38	2,145,233	134,675	26	1,102,719	67,881
Fence rails (number)	3	8,200	229	2	8,000	225
Handle stock (cords)	1	3,000	250			
Hard wood and other logs, for export (feet, scaled measure)	24	33,115,000	276,212	13	9,815,000	85,512
Hemlock bark (cords)	45	6,899	19,933	11	5,754	15,660
Hewed timber (cubic feet)	6	279,040	45,227	6	279,040	45,227
Hoop poles and hoops (number)	16	6,939,000	41,406	13	5,849,000	37,531
Hop poles (number)	1	350,000	2,200			
Logs for domestic manufacture (feet, scaled measure)	256	1,302,583,874	13,208,859	59	471,140,229	4,626,019
Masts and spars (number)	1	12	560	1	12	560
Oak bark (cords)	1	7,500	30,000			
Paving stock (cords)	23	77,401	183,246	20	58,481	114,237
Piles (number)	10	19,996	48,260	4	4,606	10,550
Pulp stock (cords)	9	1,228	3,974	7	753	2,549
Railway ties (number)	63	1,916,434	409,754	36	741,163	136,772
Rived and shaved shingles (number)	55	4,049,000	10,476	4	1,804,000	6,184
Telegraph poles (number)	19	111,380	192,846	11	100,280	187,039
Value of all other products (a)	70		3,689,820	36		1,891,808
Total value of all products			19,016,245			7,875,260
Amount received for contract labor	61		1,791,201	7		332,120

CLASSES.	WISCONSIN.			MINNESOTA.		
	Establishments reporting respective items.	Quantity.	Value.	Establishments reporting respective items.	Quantity.	Value.
Total			\$8,626,344			\$3,973,822
Charcoal (bushels)	4	464,000	42,195			
Cooperage stock (cords)	7	7,565	28,717			
Fence posts (number)	11	342,514	16,794	1	700,000	50,000
Fence rails (number)	1	200	4			
Handle stock (cords)	1	3,000	250			
Hard wood and other logs, for export (feet, scaled measure)	11	23,300,000	190,700			
Hemlock bark (cords)	34	1,145	4,273			
Hewed timber (cubic feet)						
Hoop poles and hoops (number)	3	1,090,000	3,875			
Hop poles (number)	1	350,000	2,200			
Logs for domestic manufacture (feet, scaled measure)	155	687,474,645	6,739,475	42	233,971,000	1,843,365
Masts and spars (number)						
Oak bark (cords)	1	7,500	30,000			
Paving stock (cords)	2	920	4,009	1	18,000	65,000
Piles (number)	4	2,390	11,610	2	13,000	26,000
Pulp stock (cords)	2	475	1,425			
Railway ties (number)	26	900,271	186,982	1	275,000	85,000
Rived and shaved shingles (number)	51	2,245,000	4,292			
Telegraph poles (number)	5	11,100	5,807			
Value of all other products (a)	26		470,210	8		1,327,802
Total value of all products			7,742,818			3,398,167
Amount received for contract labor	54		883,426			575,655

a The amount reported for "Value of all other products" consists principally of the value of lumber manufactured at custom mills for the owners of the material. The amount paid for such manufacture is reported on page 49, under the head of "Annual expense charges," and is included in the amount paid for all sundries not reported elsewhere. In Table 12, embracing reports of mill establishments, the amount received for such manufacture is accounted for in the item of "All other products."

DURATION OF LABOR.—From 193 reports respecting labor employed and wages paid from May to November it appears that the average length of the day's labor during that period was 10.61 hours and the average term of employment 17.31 weeks.

From 529 reports covering the time from November to May the average length of the day's labor was found to be 10.14 hours and the average term of employment 17 weeks.

DAMAGE TO STANDING TIMBER BY FIRE.—In reply to the question respecting damage to standing timber by fire reports were received from 41 establishments, which show an average annual loss of \$721 resulting from this cause.

ANNUAL EXPENSE FOR RENEWAL OF LIVE STOCK.—From the reports of 182 establishments owning 5,230 animals it is ascertained that the average annual expense for renewal of animals used in this industry amounts to \$27.22 per head.

LOCATION OF OPERATIONS.—In those cities and towns in which the statistics of manufactures were collected by special agents of this office instructions were issued to report all manufacturers of timber products on Special Schedule No. 5a as of the place where their principal office or residence is located, because it was found impracticable in many cases to fix the location of their operations. In consequence of this fact the reports in the tables following are not to be taken as showing the value of forest products actually manufactured within the boundaries of the respective counties.

TIMBER PRODUCTS IN MICHIGAN.

The following table shows, for the census year 1890, the quantity and value, by counties, of timber products reported on Special Schedule No. 5a. No inquiry had been made in previous censuses respecting this industry.

TABLE 60.—QUANTITY AND VALUE OF TIMBER PRODUCTS, BY COUNTIES.

COUNTIES.	Number of establishments.	Capital invested.	COOPERAGE STOCK.		FENCE POSTS.		FENCE RAILS.		HOOP POLES AND HOOPS.		HEWED TIMBER.	
			Cords.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Cubic feet.	Value.
Total.....	190	\$15,369,721	318	\$535	1,102,719	\$67,881	8,000	\$225	5,849,000	\$37,531	279,040	\$45,227
Alger.....	5	69,175										
Alpena.....	4	164,500			110,000	7,700						
Bay.....	15	2,662,832									77,940	5,835
Delta.....	11	90,408			64,153	3,028						
Isabella.....	5	31,559							2,500,000	12,500		
Kalkaska.....	3	217,300										
Mackinac.....	4	175,987			475,000	30,000						
Menominee.....	41	239,371			308,060	17,043						
Monroe.....	12	37,024			25,000	3,000						
Montcalm.....	4	80,254			2,000	100			300,000	1,650		
Muskegon.....	15	2,960,891										
Newaygo.....	3	135,300										
Oceana.....	4	83,849										
Oscoda.....	3	11,505										
Saginaw.....	19	2,558,624							2,469,000	19,521		
Wayne.....	9	2,790,971			12,706	508						
Wexford.....	4	940,136										
Other counties (a).....	29	2,101,035	318	535	105,800	6,502	8,000	225	580,000	3,860	201,100	39,392

a The following-named counties are grouped because there were less than three reports from each of them, the number of establishments reporting being noted after each county: Allegan, 2; Arenac, 2; Barry, 1; Berrien, 1; Chippewa, 2; Clare, 1; Emmet, 1; Gladwin, 2; Ingham, 2; Ionia, 1; Isoco, 1; Kalamazoo, 1; Kent, 1; Leelanaw, 1; Macomb, 1; Marquette, 1; Oakland, 1; Saint Clair, 1; Shiawassee, 1; Tuscola, 1; Van Buren, 2; Washtenaw, 2. No returns received from counties in this state not mentioned in the table.

TABLE 60.—QUANTITY AND VALUE OF TIMBER PRODUCTS, BY COUNTIES—Continued.

COUNTIES.	HARD WOOD AND OTHER LOGS, FOR EXPORT.		HEMLOCK BARK.		PILES.		PAVING STOCK.		PULP STOCK.		RAILWAY TIES.		RIVED AND SHAVED SHINGLES.	
	Fert. (Scaled measure.)	Value.	Cords.	Value.	Number.	Value.	Cords.	Value.	Cords.	Value.	Number.	Value.	Number.	Value.
Total.....	9,815,000	\$85,512	5,754	\$15,660	4,606	\$10,650	58,481	\$114,237	753	\$2,549	741,163	\$136,772	1,804,000	\$6,184
Alger.....											10,000	2,000		
Alpena.....											111,408	21,167		
Bay.....	3,000,000	30,500									1,725	695		
Delta.....	570,000	3,552					37,356	9,298	50	100	51,730	9,303		
Isabella.....			150	450							1,814	272		
Kalkaska.....														
Mackinac.....							4,400	20,000			184,289	36,658		
Menominee.....	150,000	750	209	636	1,666	2,000	1,748	6,962	703	2,449	101,100	18,024	240,000	480
Monroe.....			3,600	4,500			600	4,800			5,000	1,250		
Montcalm.....	100,000	1,000	250	750			39	132			2,000	580		
Muskegon.....			300	1,200							21,174	4,581		
Newaygo.....											5,000	1,500	1,500,000	5,000
Oceana.....	2,500,000	12,500	775	2,954							7,000	900		
Oscoda.....													64,000	704
Saginaw.....					2,200	7,000								
Wayne.....							6,176	45,441			27,548	4,132		
Wexford.....														
Other counties (a).....	3,495,000	37,210	1,070	5,170	740	1,650	8,162	27,604			211,375	35,650		

COUNTIES.	MASTS AND SPARS.		CHARCOAL.		TELEGRAPH POLES.		LOGS FOR DOMESTIC MANUFACTURE.		Amount received for contract labor.	Value of all other products. (b)	Total value of all products.
	Number.	Value.	Bushels.	Value.	Number.	Value.	Fert. (Scaled measure.)	Value.			
Total.....	12	\$560	9,473,704	\$646,871	100,280	\$187,039	471,140,229	\$4,626,019	\$332,120	\$1,891,808	\$8,207,380
Alger.....			800,000	60,000			5,000,000	50,000		3,790	115,790
Alpena.....					330	165	2,600,000	19,500		40,000	88,532
Bay.....							72,248,549	633,653	111,051	912,938	1,694,672
Delta.....			1,294,535	96,544	164	62	403,520	3,228		11,919	137,034
Isabella.....			450,000	38,000						12,000	63,222
Kalkaska.....			700,000	42,000			2,000,000	20,000			62,000
Mackinac.....			1,000,000	57,500	29,032	29,669	3,769,000	32,902			206,729
Menominee.....			2,171,400	150,868	6,600	5,275	2,743,462	14,843	62,750	167,860	449,940
Monroe.....			201,900	17,393	60,000	150,000					176,443
Montcalm.....			54,000	2,700	154	77	4,850,000	24,400			31,389
Muskegon.....			7,800	556			123,765,361	1,121,957		6,019	1,137,613
Newaygo.....							31,265,000	207,845			215,545
Oceana.....			1,200,000	66,000			3,000,000	15,000	45,000		142,414
Oscoda.....			320,000	26,500							27,204
Saginaw.....			18,000	1,800			8,400,000	74,500	113,319	719,269	935,409
Wayne.....			238,154	14,070			91,841,927	1,168,839			1,232,990
Wexford.....			107,500	8,600			25,329,000	202,944		5,000	216,544
Other counties (a).....	12	560	910,415	64,340	4,000	1,791	93,924,410	1,036,408		13,613	1,273,910

a See note a, preceding page.

b The amount reported under the head "Value of all other products" consists principally of the value of lumber manufactured at custom mills for the owners of the material. The amount paid for such manufacture is reported in Table 59, on page 49, under the head of "Annual expense charges," and is included in the amount paid for all sundries not reported elsewhere. In Table 12, embracing reports of mill establishments, the amount received for such manufacture is accounted for in the item of "All other products."

Application was made by this office to the surveyors and clerks of the respective counties in each state, requesting information as to the area of timbered land and the quantity and variety of merchantable standing timber in each county. All the reports received from Michigan are given below. In those counties for which no report is published the information requested was not furnished. The term "merchantable timber" means any variety of timber growth which is capable of manufacture into lumber fit for market. By the term "forest land" is meant that portion of uncultivated area which is principally wooded.

Alcona.—The total area of forest land is estimated to be 203,000 acres, of which 105,000 acres contain merchantable timber in the following proportions of quantity for the principal varieties: White pine, 25; Norway pine, 20; hemlock, 50; cedar, 25; oak, 10; ash, 2; elm, 3; maple, beech, and birch, 2.

Alpena.—The total area of forest land is estimated to be 280,000 acres, of which 125,000 acres contain merchantable timber, about 200,000,000 feet of this being white pine and about 75,000,000 feet Norway pine, the remainder consisting of cedar, hemlock, tamarack, and beech.

Antrim.—The total area of forest land is estimated to be 200,000 acres, of which 175,000 acres contain more or less merchantable timber, principally maple and hemlock.

Arenac.—The total area of forest land is estimated to be 190,000 acres, of which 75,000 acres contain merchantable timber, principally soft woods.

Baraga.—No estimate furnished respecting area or quantity. The county clerk reports that the county contains thirty-one surveyed townships, all covered with a growth of hard and soft wood timber.

Barry.—No estimate furnished respecting area or quantity. The principal varieties of timber growth are beech, maple, and oak.

Branch.—This county was once heavily timbered, but the timber is now nearly exhausted. The total area of forest land is estimated to be 3,000 acres, of which about 1,200 acres contain merchantable timber, mostly hard wood.

Calhoun.—The total area of forest land is estimated to be 7,200 acres, of which about 1,800 acres contain merchantable oak and hickory, mostly second growth.

Cass.—This county reports 25,000 acres containing merchantable timber, consisting principally of hard woods.

Charlevoix.—No report as to area of forest land or merchantable timber. Less than 10 per cent of the entire forest area has been cleared. The merchantable timber consists principally of maple, beech, and birch, with some cedar.

Clare.—The total area of forest land is estimated to be 339,231 acres, of which 17,899 acres contain merchantable white pine.

Clinton.—This county is estimated to have 46,000 acres containing merchantable timber in the following proportions: 20,000 acres of oak, 23,000 acres of maple and beech, and 3,000 acres of tamarack.

Delta.—The total area of forest land is estimated to be 678,122 acres, of which 389,868 acres contain merchantable timber, consisting of hemlock, cedar, maple and birch, and pine, the principal varieties being in the order named. The pine is estimated to aggregate 150,000,000 feet of white and Norway.

Eaton.—Ninety per cent of the forest area contains merchantable hard-wood timber. Extent of such area not reported.

Emmet.—Estimated area of forest land 189,000 acres. Estimated area of merchantable timber 126,000 acres, containing varieties in the following proportions: Hemlock, 5; basswood, 3; cedar, 3; Norway pine, 2; white pine, 1; maple, beech, and birch, 14; elm, 3; ash, 2; oak, 1.

Genesee.—This county is mostly under cultivation. Of the total area 12.50 per cent is estimated to be forest, one-fourth of which consists of merchantable hard wood, principally oak, maple, and beech.

Gladwin.—The principal merchantable timber of this county formerly consisted of white pine, which is now mostly removed. A large part of the hard-wood forest has been devastated by fire since the pine was cut. Present area of forest estimated at 300,000 acres, of which two-thirds contain merchantable pine, hemlock, cedar, and hard wood.

Grand Traverse.—The total area of forest land is estimated to be 237,000 acres, of which 175,000 acres contain merchantable timber, principally sugar maple, but including beech, elm, hemlock, cedar, and some pine.

Huron.—The merchantable timber has been nearly all lumbered. The total forest area in "green timber" is estimated to be 41,000 acres, of which about 30,000 acres contain merchantable timber, consisting principally of hemlock and cedar, with some hard wood.

Ingham.—This county has been settled for many years and is mostly under cultivation. The principal part of the timber now standing is in small-wood lots, kept by farmers for their own use. It is principally hard wood, and generally of good quality.

Iron.—Estimated area of forest land 700,000 acres, of which 450,000 acres are estimated to contain merchantable timber, principally a fine quality of hard maple, with some pine and considerable cedar, hemlock, and birch.

Isabella.—The total area of timbered land is estimated to be 231,220 acres, which may be divided with respect to the principal varieties of merchantable timber as follows: 2,400 acres containing white pine principally; 120,000 acres containing miscellaneous soft woods; 108,820 acres containing hard woods, 70 per cent of which is beech and maple. The total estimated quantity of merchantable white pine now standing is estimated to be 180,000,000 feet.

Jackson.—Accurate data unobtainable. An estimate based on two average townships makes the total area containing merchantable timber to be 60,000 acres, oak being the principal variety.

Kalamazoo.—Accurate data unobtainable. Total area of county 576 square miles, of which about 500 square miles were once heavily timbered with hard woods. The present area containing merchantable timber is estimated at 40,000 acres.

Kalkaska.—Estimated area of forest land 125,000 acres, of which about 120,000 acres contain merchantable timber in mixed hard wood, maple, elm, beech, and birch, with maple predominating.

Lapeer.—Accurate data unobtainable. This county has been thoroughly lumbered for pine and white oak. The pine lands have been devastated by fire. Small quantity of cedar and miscellaneous hard woods left.

Leelanaw.—Accurate data unobtainable. About 65 per cent of the total area is in forest, and about 15 per cent contains merchantable timber, hard maple being the principal variety.

Livingston.—Estimated area of forest land 50,000 acres. Estimated area containing merchantable timber 10,000 acres, the principal varieties of timber being in about the following proportions: Oak, 40; ash, 2; elm, 2; miscellaneous hard woods, 3; miscellaneous soft woods, 4.

Luce.—The total area of this county is stated as follows: 200,000 acres in swamp; 200,000 acres in beech, birch, and maple; 190,000 acres in miscellaneous varieties, estimated to embrace 400,000,000 feet of white pine; 50,000,000 feet of Norway pine, and a large quantity of hemlock and valuable cedar.

Mackinac.—The total area of this county is 690,966 acres, of which 90,000 acres are marsh and swamp containing no merchantable timber. As to varieties, the remainder is divided about as follows: 20,000 acres in white pine; 5,000 acres in Norway pine; 90,000 acres in hemlock; 150,000 acres in cedar; 35,000 acres in mixed soft woods. There is no oak, very little elm and ash, and, say, 100,000 acres in maple, beech, and birch.

Manistee.—The total area of forest is estimated to be 65,000 acres, of which 60,000 acres contain merchantable timber of pine, cedar, hemlock, and hard woods. An accurate estimate respecting quantity of timber is unobtainable.

Midland.—The total area of forest is estimated to be 250,000 acres, of which 150,000 acres are said to contain merchantable timber in about equal quantities of hemlock and cedar, with considerable maple, beech, birch, and other hard woods. Of white and Norway pine there are only about 25,000,000 feet remaining.

Montcalm.—The total area of forest is estimated to be about 24,000 acres, of which 20,000 acres contain merchantable timber. There are not over 25,000,000 feet of white pine now standing, and not any Norway pine. The cutting of the pine forests has nearly destroyed all other forest growth on the uplands. There are small areas of valuable hard-wood timber held by farmers on their "wood lots," but most of the timber remaining in this county consists of those varieties of soft woods indigenous to swamp lands.

Montmorency.—The total area of this county is 390,800 acres, and it is estimated that the area of merchantable timber by varieties is as follows: 75,000 acres of white and Norway pine; 40,000 acres of hemlock; 10,000 acres of cedar; 15,000 acres of mixed soft woods; 5,000 acres of ash; 125,000 acres of maple, beech, and birch; 10,000 acres of mixed hard woods.

Ontonagon.—The total area of forest is estimated at 639,360 acres, of which 426,240 acres contain merchantable timber, consisting principally of white and Norway pine, hemlock, cedar, maple, birch, and poplar.

Osceola.—The total area of forest land is estimated to be 135,000 acres, of which there is reported to be but little containing merchantable timber. The original growth of pine and hemlock has been removed, and the hard wood remaining contains but little which can be classed as merchantable.

Oscoda.—The total area of forest land is estimated to be 140,000 acres, of which 92,000 acres contain merchantable timber in the proportions of 10 per cent white pine and 90 per cent maple, beech, and birch.

Otsego.—No accurate data. Estimated area of forest land 230,400 acres, containing hard-wood timber.

Ottawa.—About 20 per cent of the total county area contains merchantable timber in about the following proportions as to variety: Maple and beech, 15 per cent; hemlock, 2 per cent; ash, 1 per cent; elm, 1 per cent; oak, 1 per cent. The pine has all been lumbered.

Presque Isle.—The total area of forest land is estimated to be 286,200 acres, of which 234,900 acres contain merchantable timber as follows:

	FEET.		FEET.		FEET.
White pine.....	2,000,000	Oak.....	500,000	Maple, beech, and birch.....	300,000,000
Norway pine.....	1,000,000	Ash.....	2,100,000	Mixed soft woods.....	1,000,000
Hemlock.....	200,000,000	Elm.....	3,000,000	Mixed hard woods.....	100,000,000
Cedar.....	250,000,000				

Saint Clair.—Very little if any natural forest remains. There may be 200 acres of land containing merchantable timber of elm, oak, and basswood in scattering lots.

Sanilac.—The total area of forest estimated at 290,000 acres, of which but 25,000 acres are estimated to contain merchantable timber. All the pine and hemlock have been lumbered, and the hard-wood timber has been killed to a great extent by forest fires.

Washtenaw.—No data for a full report. This county is estimated to contain 30,000 acres of forest, of which not exceeding one-third contains merchantable timber, which is mostly hard wood.

Wexford.—The estimated forest area containing merchantable timber is estimated to be 246,800 acres, of which 61,700 acres are principally in pine, hemlock, and cedar, and the remainder in hard woods.

TIMBER PRODUCTS IN WISCONSIN.

The following table shows, for the census year 1890, the quantity and value, by counties, of timber products reported on Special Schedule No. 5a. No inquiry had been made in previous censuses respecting this industry.

TABLE 61.—QUANTITY AND VALUE OF TIMBER PRODUCTS, BY COUNTIES.

COUNTIES.	Number of establishments.	Capital invested.	COOPERAGE STOCK.		FENCE POSTS.		FENCE RAILS.		HOOP POLES.		HOOP POLES AND HOOKS.	
			Cords.	Value.	Number.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
Total	312	\$20,299,071	7,565	\$28,717	342,514	\$16,794	200	\$4	350,000	\$2,200	1,090,000	\$3,875
Bayfield	5	771,950	400	1,400								
Chippewa	66	13,571,780										
Door	48	195										
Eau Claire	13	433,700										
Lincoln	26	376,461										
Marathon	66	839,081	34	1,020	60,064	1,908						
Marinette	8	835,432			258,000	13,400						
Oconto	23	1,143,074	131	297	2,350	114	200	4				
Oncida	4	498,425										
Polk	6	203,775										
Portage	6	22,430										
Saint Croix	4	23,600										
Shawano	5	12,220			10,000	700			350,000	2,200	75,000	560
Winnebago	10	544,345										
Wood	6	81,380	7,000	26,000								
Other counties (a)	16	938,203			11,200	672					1,015,000	3,315

COUNTIES.	HARD WOOD AND OTHER LOGS, FOR EXPORT.		HANDLE STOCK.		HEMLOCK BARK.		OAK BARK.		PILES.		PAVING STOCK.		PULP STOCK.	
	Fect. (Scaled measure.)	Value.	Cords.	Value.	Cords.	Value.	Cords.	Value.	Number.	Value.	Cords.	Value.	Cords.	Value.
Total	23,300,000	\$190,700	3	\$250	1,145	\$4,273	7,500	\$30,000	2,300	\$11,610	920	\$4,009	475	\$1,42
Bayfield														
Chippewa														
Door														
Eau Claire														
Lincoln													475	1,425
Marathon	18,200,000	152,900			1,145	4,273			90	110				
Marinette									1,500	4,500	400	1,800		
Oconto	1,000,000	6,000					7,500	30,000						
Oncida														
Polk														
Portage														
Saint Croix	1,050,000	12,000							800	7,000				
Shawano											250	1,400		
Winnebago														
Wood	150,000	3,300												
Other counties (a)	2,900,000	16,500	3	250							240	809		

a The following-named counties are grouped because there were less than three reports from each of them; the number of establishments reporting is noted after each county: Ashland, 1; Brown, 2; Calumet, 1; Clark, 1; Douglas, 2; Dunn, 1; Florence, 1; Jackson, 2; Langlade, 1; Pierce, 1; Sauk, 1; Sheboygan, 1; Waupaca, 1. No returns received from counties in this state not mentioned in the table.

TABLE 61.—QUANTITY AND VALUE OF TIMBER PRODUCTS, BY COUNTIES—Continued.

COUNTIES.	RAILWAY TIES.		RIVED AND SHAVED SHINGLES.		CHARCOAL.		TELEGRAPH POLES.		LOGS FOR DOMESTIC MANUFACTURE.		Amount received for contract labor.	Value of all other products. (a)	Total value of all products.
	Number.	Value.	Number.	Value.	Busbels.	Value.	Number.	Value.	Feet. (Scaled measure.)	Value.			
Total.....	900,271	\$186,982	2,245,000	\$4,292	464,000	\$42,195	11,100	\$5,807	687,474,645	\$6,739,475	\$883,426	\$470,210	\$8,626,244
Bayfield.....									27,250,000	262,500			263,900
Chippewa.....									317,270,920	3,628,105	423,564	50,139	4,101,808
Door.....			1,968,000	3,792									3,792
Eau Claire.....									20,700,000	177,300	231,478		408,778
Lincoln.....	63,965	11,793							53,246,800	387,422	2,400		403,040
Marathon.....	506,356	110,814							64,339,925	556,454		25,655	853,134
Marquette.....	303,000	58,480					3,600	1,675	20,100,000	160,800	4,400	356,306	601,361
Oconto.....	6,000	1,000	277,000	500			4,000	1,600	67,750,000	621,950	85,492	1,235	748,192
Oneida.....									24,500,000	173,500	70,000		243,500
Polk.....									11,635,000	110,645	1,200	3,000	114,905
Portage.....									1,723,000	13,784	6,365	5,800	25,949
Saint Croix.....	10,000	2,800							860,000	7,320			29,320
Shawano.....	250	45			137,000	7,575	3,200	2,400	65,000	325			15,165
Winneshago.....									12,350,000	101,450	58,467	22,125	182,042
Wood.....					112,000	6,160			5,934,000	35,920			71,380
Other counties (b).....	10,700	2,050			215,000	28,500	300	132	59,700,000	501,800		5,950	559,978

a The amount reported under the head "Value of all other products" consists principally of the value of lumber manufactured at custom mills for the owners of the material. The amount paid for such manufacture is reported in Table 59, on page 49, under the head of "Annual expense charges," and is included in the amount paid for all sundries not reported elsewhere. In Table 12, embracing reports of mill establishments, the amount received for such manufacture is accounted for in the item of "All other products."

b See note a, preceding page.

Application was made by this office to the surveyors and clerks of the respective counties in each state, requesting information as to the area of timbered land and the quantity and variety of merchantable standing timber in each county. All the reports received from Wisconsin are given below. In those counties for which no report is published the information requested was not furnished. The term "merchantable timber" means any variety of timber growth which is capable of manufacture into lumber fit for market. By the term "forest land" is meant that portion of uncultivated area which is principally wooded.

Barron.—The area of forest land is estimated to be 225,000 acres, of which 125,000 acres contain merchantable timber, one-third of which is white pine, the remainder being mixed hard and soft woods.

Brown.—But little merchantable timber of value. The area of forest land is estimated to be 75,000 acres, of which about 10,000 acres contain some bard-wood timber of merchantable quality.

Buffalo.—No pine, hemlock, or cedar. About 50,000 acres are estimated to contain merchantable timber in the following proportions: 20,000 acres in oak, with a small quantity of hickory, 20,000 acres in ash, elm, and other hard woods, and 10,000 acres in soft woods.

Barnett.—The area containing merchantable timber is estimated as follows: 96,000 acres containing white pine, 100,000 acres containing Norway pine, 60,000 acres containing cedar, 150,000 acres containing miscellaneous soft woods, 60,000 acres containing oak, 40,000 acres containing ash, 50,000 acres containing maple and birch, and 14,000 acres containing miscellaneous hard woods.

Chippewa.—This county is nearly all wooded, and 500,000 acres are estimated to contain merchantable timber of the several varieties of hard and soft woods indigenous to this state, the principal variety being white pine.

Columbia.—There is said to be no considerable area of merchantable timber. There are estimated to be 10,000 acres of wooded land in groves or "openings," consisting principally of oak, aspen, and some elm, ash, basswood, hickory, maple, and whitewood.

Crawford.—The area of forest land is estimated to be 175,000 acres, of which one-fifth contains merchantable timber, the principal variety being oak and other hard woods.

Dane.—No estimate as to area of forest land. The area containing merchantable timber is stated to be very small. Timber is principally oak of second growth.

Door.—The area of forest land is reported to be 23,040 acres, containing maple, beech, and birch. There is practically no merchantable timber left. When the pine was removed the fires which ran through the slashings destroyed the remaining timber, which would now be valuable if it had been preserved.

Florence.—The area of forest land is estimated to be 307,806 acres, of which 287,966 acres are said to contain merchantable timber, consisting of white and Norway pine, hemlock, cedar, maple, and birch.

Fond du Lac.—The area of forest land is estimated to be 65,000 acres, the varieties being distributed as follows: 35,000 acres of second growth bur oak, white oak, and black oak; 20,000 acres of miscellaneous hard and soft woods; 10,000 acres of tamarack, and some cedar.

Forest.—Nearly the entire area of this county is wooded, and contains merchantable timber of the several varieties indigenous to the state, the principal varieties being white and Norway pine, with hemlock, cedar, basswood, and miscellaneous hard woods.

Green.—The estimated area of forest is 20,000 acres, of which about one-fourth contains merchantable timber, the principal varieties being oak and other hard woods. It is noted in the report that the growth of timber has increased materially since the introduction of barbed-wire fencing.

Green Lake.—The estimated area of forest is 21,000 acres, containing little or no merchantable timber as defined. There are about 5,000 acres containing aspen and tamarack, suitable for pulp stock; 13,000 acres containing oak, suitable for railway ties and posts; the remaining timber is only suitable for firewood.

Iowa.—The estimated area of forest is 70,000 acres, containing no merchantable timber.

Jackson.—The estimated area of forest is 100,000 acres, of which about one-third contains merchantable timber, the most valuable being white pine and oak.

Juneau.—The estimated area of forest land is 34,425 acres, of which it is estimated 20,000 acres contain merchantable timber, consisting of pine, basswood, oak, and maple.

Kenosha.—The estimated area of forest land is 15,900 acres, containing but little merchantable timber. What may be fit for manufacture consists principally of oak.

La Crosse.—No report as to area of forest land. It is estimated that no merchantable timber exists in any considerable quantity.

Lincoln.—The estimated area of forest is 300,000 acres, of which 250,000 acres contain merchantable timber in the following proportions: 40 per cent pine, 40 per cent hemlock, and 20 per cent miscellaneous soft and hard woods.

Manitowoc.—The estimated area of forest is 39,800 acres, of which about ten per cent contains miscellaneous hard woods of merchantable quality.

Marathon.—The estimated area of forest is 99,127 acres, of which it is estimated that 50,000 acres contain white pine of merchantable quality.

Marquette.—The estimated area of forest land is 70,000 acres, of which but very little contains merchantable timber, not exceeding 500 acres. The principal variety is oak.

Mouroe.—The estimated area of forest is 280,000 acres, of which 70,000 acres are well timbered, the principal varieties being in the following proportions: White pine, 20; Norway pine, 10; oak, 40; with miscellaneous hard and soft woods of less value.

Ozaukee.—The estimated area of forest land is 18,688 acres, of which 10,000 acres contain merchantable timber in about the following proportions as to variety: Maple, beech, and birch, 6; ash, 3; oak, 2; mixed hard woods, 3; cedar, 1; mixed soft woods, 3.

Pepin.—The estimated area of forest land is 52,000 acres, and it is estimated that 10 per cent of the growth is merchantable timber, mostly maple, oak, ash, and elm.

Pierce.—The estimated area of forest land is 173,700 acres, of which 100,000 acres are estimated to contain merchantable timber of linden, sugar maple, rock elm, and oak.

Polk.—The total area of forest land is estimated to be 279,000 acres, of which 152,000 acres contain merchantable timber, the principal varieties being distributed as follows: 59,000 acres in white pine and 93,000 acres in miscellaneous hard woods.

Price.—The total area of timbered land is estimated to be 322,560 acres, of which 138,240 acres are in white pine, 69,120 acres in hemlock, and 115,240 acres in miscellaneous hard woods. There is a heavy growth of birch, maple, basswood, and hemlock of good quality, with some elm and cedar.

Racine.—The total area of forest land is estimated at 26,500 acres. The principal variety of merchantable timber is oak.

Richland.—The total area of forest land is estimated at 92,857 acres, of which 43,400 acres contain merchantable timber, consisting principally of basswood, elm, oak, and maple.

Rock.—It is stated that there is no considerable growth of merchantable timber in this county. The forest growth is only suitable for firewood.

Saint Croix.—Area of forest land is estimated at 78,800 acres, of which 30,000 acres contain merchantable timber. About one-third is white pine, the remainder hard wood.

Sheboygan.—Area of forest land is estimated to be 88,270 acres, but there is practically no merchantable timber left.

Taylor.—There is estimated to be 600,000 acres of forest land in this county, containing one hundred million feet of merchantable pine and two and one-half billion feet of merchantable hemlock now standing.

Trempealeau.—There is said to be no merchantable timber growth. The forest growth consists of small oak openings, of which the area has not been ascertained.

Vernon.—The total area of forest land is estimated at 209,033 acres, of which 75,000 acres contain merchantable timber in about the following proportions: Oak, 70; ash, 5; elm, 10; maple and birch, 10; mixed soft woods, 5.

Walworth.—The total area of forest land is estimated to be 39,696 acres, of which about 6,000 acres contain oak of merchantable quality.

Washburn.—The total area of forest land is estimated to be 450,000 acres, of which about 200,000 acres, situated mostly in the eastern portion of the county, contain merchantable timber, principally white and Norway pine, the white pine being interspersed with hard woods.

Waukesha.—The total area of forest land is estimated to be 38,593 acres, of which about 30,000 acres contain a small quantity of merchantable hard-wood timber.

Winnebago.—The total area of forest land is estimated to be 16,452 acres, containing but little merchantable timber. The principal varieties are oak, maple, elm, and basswood, which is only fit for fuel at its present stage of growth.

TIMBER PRODUCTS IN MINNESOTA.

The following table shows, for the census year 1890, the quantity and value, by counties, of timber products reported on Special Schedule No. 5a. No inquiry had been made in previous censuses respecting this industry.

TABLE 62.—QUANTITY AND VALUE OF TIMBER PRODUCTS, BY COUNTIES.

COUNTIES.	Number of establishments.	Capital invested.	FENCE POSTS.		PAYING STOCK.		PILES.	
			Number.	Value.	Cords.	Value.	Number of pieces.	Value.
Total	72	\$11,096,613	700,000	\$50,000	18,000	\$65,000	13,000	\$26,000
Hennepin	53	9,382,046					8,000	16,000
Ramsey	3	252,500	700,000	50,000	18,000	65,000	5,000	10,000
Saint Louis	3	987,767						
Stearns	3	337,000						
Other counties (a)	5	137,300						

COUNTIES.	RAILWAY TIES.		LOGS FOR DOMESTIC MANUFACTURE.		Amount received for contract labor.	Value of all other products. (b)	Total value of all products.
	Number.	Value.	Feet. (Scaled measure.)	Value.			
Total	275,000	\$86,000	233,971,000	\$1,843,365	\$575,655	\$1,327,802	\$3,973,822
Hennepin	275,000	86,000	154,917,000	1,310,501	575,655	1,238,944	3,227,100
Ramsey			10,000,000	58,500		1,205	184,705
Saint Louis			35,100,000	217,350		87,653	305,003
Stearns			24,600,000	195,000			195,000
Other counties (a)			9,354,000	62,014			62,014

a The following-named counties are grouped because there were less than three reports from each of them; the number of establishments reporting is noted after each county: Anoka, 2; Douglas, 1; Le Sueur, 1; Washington, 1. No returns received from counties in this state not mentioned in the table.

b The amount reported in Table 40 under the head "Value of all other products" consists principally of the value of lumber manufactured at custom mills for the owners of the material. The amount paid for such manufacture is reported in Table 59 under the head of "Miscellaneous expenses." It is not included elsewhere in the classification of timber products. In the preceding tables, embracing reports of mill establishments, the amount received for such manufacture is accounted for in the item of "All other products."

Application was made by this office to the surveyors and clerks of the respective counties in each state, requesting information as to the area of timbered land and the quantity and variety of merchantable standing timber in each county. All the reports received from Minnesota are given below. In those counties for which no report is published the information requested was not furnished. The term "merchantable timber" means any variety of timber growth which is capable of manufacture into lumber fit for market. By the term "forest land" is meant that portion of uncultivated area which is principally wooded.

Aitkin.—Estimated area of forest land 1,200,000 acres, of which 700,000 acres are estimated to contain merchantable timber. The principal varieties are white and Norway pine and oak. It is stated that the greater portion of the pine has been lumbered.

Anoka.—No area of forest growth reported. The county auditor states: "We have not much timbered land in this county. The forest growth is only suitable for fuel."

Becker.—This county is estimated to contain about 425,000 acres of timbered land. The principal varieties are white and Norway pine, with some hard wood.

Big Stone.—Area of forest growth estimated to be 1,200 acres, containing no merchantable timber.

Brown.—There is reported to be some merchantable hard-wood timber growth along the Minnesota and Cottonwood rivers, but in what quantity or area no reliable data are furnished.

Carlton.—Estimated area of forest land 500,000 acres, of which 200,000 acres are estimated to contain merchantable timber. The principal varieties of timber are white and Norway pine and white oak.

Carver.—Estimated area of forest land 7,000 acres, of which about 15 per cent contains oak, ash, elm, and maple of merchantable quality.

Chippewa.—Estimated area of forest land 5,000 acres, containing no merchantable timber.

Chicago.—Estimated area of forest land 189,000 acres, of which 63,000 acres are estimated to contain merchantable maple and miscellaneous soft woods, the proportion of maple to soft woods being as 3 to 1.

Crow Wing.—Estimated area of forest land 500,000 acres, of which one-half contains merchantable timber. The principal varieties are white and Norway pine, the latter predominating, as lumbermen have been cutting white pine for the last thirty years. There is an extensive growth of merchantable hard woods.

Dodge.—Estimated area of forest land 10,000 acres, of which one-fifth contains merchantable hard and soft woods, the former predominating.

Faribault.—This is essentially a prairie county. There is some timber growth around lakes and streams, but no considerable quantity of merchantable timber.

Freeborn.—Estimated area of forest land 33,000 acres, of which one-third contains merchantable hard-wood timber, two-thirds of which is oak.

Grant.—This is a prairie county, containing but little wooded land and no merchantable timber.

Hennepin.—From 25 to 30 per cent of the total county area is reported as uncultivated and partially wooded, with a small area of merchantable hard-wood timber.

Kanabec.—Area of forest land estimated to be 300,000 acres, of which one-half contains white pine, oak, and other merchantable timber. The average annual cut of standing white pine in this county is reported to exceed 60,000,000 feet.

Kandiyohi.—The area of forest land is estimated to be 10,000 acres, of which one-half is estimated to contain merchantable hard-wood timber.

Lacquiparle.—Area of forest land estimated to be 1,000 acres, containing no merchantable timber.

Lake.—No data respecting area of forest land, about one-half the county area being still unsurveyed. It contains an extensive growth of merchantable timber, the principal varieties being white and Norway pine and white birch.

Lyon.—The area of forest land is estimated to be 2,500 acres, containing no merchantable timber.

McLeod.—The area of forest land is estimated to be 33,280 acres, of which 28,160 acres contain merchantable timber. No data respecting principal varieties.

Martin.—There is but little wooded area and no merchantable timber.

Meeker.—There is but little wooded area and no merchantable timber.

Millie Lacs.—Area of forest estimated to be 350,000 acres, of which about 200,000 acres contain merchantable white and Norway pine and 50,000 acres merchantable hard wood.

Morrison.—About one-half of the entire area is reported to contain merchantable timber in about equal parts of pine and hard wood. It is estimated that 2,000,000,000 feet of merchantable pine is now standing, and about that quantity has been removed.

Mower.—There is but little wooded area and no merchantable timber.

Murray.—There is but little wooded area, perhaps 2,000 acres. A small quantity of oak, ash, and elm is of merchantable growth.

Nicollet.—The estimated area of forest is 30,000 acres, of which about 14,000 acres contain merchantable hard-wood timber, elm being the principal variety, with some oak, maple, and linden.

Norman.—No data respecting area of timbered land. There is a growth of merchantable hard wood along the Rice and Red rivers, which is being manufactured to a limited extent.

Olusted.—The estimated wooded area is 39,000 acres, of which a small portion, say 300 acres, contains merchantable hard-wood timber.

Pine.—The area of forest is estimated to be 900,000 acres, of which about 400,000 acres are well timbered with white and Norway pine and 300,000 acres are principally timbered with hard woods of merchantable quality.

Pipe Stone.—This is a prairie county, having no natural timber.

Polk.—Estimated area of forest land 214,700 acres, of which 55,000 acres contain merchantable timber about as follows: 2,000 acres of white pine, 1,500 acres of Norway pine, 30 acres of miscellaneous soft woods, 11,500 acres of oak, 4,000 acres of maple and birch, and 6,000 acres of miscellaneous hard woods.

Pope.—The area of forest is estimated to be 36,900 acres, of which 23,000 acres contain merchantable timber, the principal variety being oak.

Ramsey.—Practically no merchantable timber and but little forest land. The uplands were originally wooded with oak, which has been removed.

Renville.—No data respecting area of forest land. There is no merchantable timber. The area bordering on the Minnesota river has a wooded growth suitable for fuel.

Rock.—It is estimated that about 640 acres skirting Rock river are wooded with cottonwood, ash, and elm, but there is no timber of merchantable quality.

Scott.—The area of forest land is estimated to be 85,000 acres, of which 38,000 acres contain merchantable hard-wood timber.

Sherburne.—No data respecting forest area. There is a growth of merchantable timber of the varieties of hard wood indigenous to this state, but its area is not reported.

Sibley.—Estimated forest area 50,000 acres, of which 20,000 acres contain merchantable timber, the principal variety being elm. Basswood ranks next in quantity and value, with maple, cottonwood, oak, ash, and butternut following in the order stated.

Stearns.—Estimated area of forest land 400,000 acres, of which about one-fourth contains merchantable timber, hard woods predominating in quantity and value.

Steele.—Estimated area of forest land 46,000 acres, of which about 10,000 acres contain merchantable timber, hard wood predominating.

Stevens.—There is very little natural growth of timber in this county; what exists is found skirting the lakes. The timber which has been planted is principally cottonwood, elder, and willow. This, with the natural timber, will probably amount to 500 acres. No merchantable timber.

Swift.—Estimated area of wooded land 2,000 acres, situated adjacent to the lakes and streams. No merchantable timber.

Traverse.—This county is almost entirely a treeless prairie. There is a small wooded area adjacent to Lake Traverse.

Wadena.—Estimated area of forest 150,000 acres, of which about 1,500 acres contain pine, oak, and tamarack. Most of the original growth of merchantable timber has been removed, and a great portion of the area has since been burned over and the young timber killed.

Washington.—The area of forest land is estimated to be 75,000 acres. Very little merchantable timber.

Watonwan.—There are about 450 acres of natural forest adjoining the water courses and about 2,000 acres of planted forest growth. There are about 200 acres of oak and black walnut of merchantable size and quality.

Wilkin.—Estimated area of forest land 2,500 acres, which lies along the Red river. No merchantable timber.

Winona.—No accurate data respecting forest area. There is no merchantable timber, and but little timber growth of any sort.

Wright.—Originally nearly all the land area was wooded. The estimated area of forest now standing is about 80,000 acres, of which about one-half contains merchantable hard-wood timber.

Yellow Medicine.—This is a prairie county. There is some forest growth along the river bottoms, but it is only fit for fuel. No data as to its area.

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TO

LUMBER MILLS AND SAW MILLS AND TIMBER PRODUCTS

IN

MICHIGAN, WISCONSIN, AND MINNESOTA.

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